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THE
PROCEEDINGS
OF THE
LINNEAN SOCIETY
OF
NEW SOUTH WALES.

(SECOND SERIES.)

VOL. V.
WITH TWENTY PLATES.

FOR THE YEAR 1890.

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(SECOND SERIES.)

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ERRATA.—VOL. V.
(SECOND SERIES.)

- Page 190, line 14—for *Promocoderus* read *Promecoderus*
Page 210, line 22—for *striato-punctatis* read *striato-punctatus*
Page 226, line 21—*Promecoderus semiviolacea* read *Promecoderus semiviolaceus*
Page 258, line 9—in the explanation of figs. 1-3 of Pl. ix., for Nat. size read slightly reduced
Page 466, line 6—for *D. nudicapititata* read *D. nudicapitata*
Page 506, line 6—for excelled read equalled
Page 672, line 5—for *Limodynastes* read *Limnodynastes*
Page 689, line 4—after Australia read Part i.
Page 886, line 22—for forms read forms,

PROCEEDINGS
OF THE
LINNEAN SOCIETY
OF
NEW SOUTH WALES.

WEDNESDAY, 29TH JANUARY, 1890.

The President, Professor Stephens, M.A., F.G.S., in the Chair.

Dr. W. Lloyd Mathias, Darlinghurst, was elected a member of the Society.

DONATIONS.

Two Pamphlets entitled "Sterculia Gum : its Similarities and Dissimilarities to Tragacanth, occurrence of Pararabin in Sterculia Gums ;" "The Resin of Myoporum platycarpum." By J. H. Maiden, F.L.S., &c. *From the Author.*

"Monatliche Mittheilungen des naturwissenschaftl. Vereins des Reg.-Bez. Frankfort." Jahrg. VI., Nos. 10-12 ; VII., Nos. 1 and 2 (Jan.-May. 1889) ; "Societatum Litterae." Jahrg. II. ; Nos. 11 and 12 ; III., Nos. 1-3 (Nov., 1888—March, 1889). *From the Society.*

"Mémoires de la Société des Naturalistes de Kiew." Tome X. Liv. 1 (1889). *From the Society.*

"A Monograph of the Horny Sponges." By Robert von Lendenfeld. *From the Trustees of the Australian Museum.*

"Transactions of the Cambridge Philosophical Society." Vol. XIV., Part 4 (1889). *From the Society.*

"Department of Agriculture, Queensland.—Report of the Government Scientific Expedition to Bellenden-Ker Range, upon the Flora and Fauna of that part of the Colony." *From F. M. Bailey, Esq., F.L.S.*

"Bulletin of the Museum of Comparative Zoology at Harvard College, Cambridge, U.S.A." Vol. XVII., No. 5 (1889). *From the Curator.*

"The Gold-Fields of Victoria. — Reports of the Mining Registrars for the quarter ended 30th September, 1889." *From the Secretary for Mines, Melbourne.*

"Annual Report of the Department of Mines, New South Wales, for the year 1888." *From the Minister for Mines.*

"Johns Hopkins University Circulars." Vol. IX., No. 76 (1889). *From the University.*

"Zoologischer Anzeiger." XII. Jahrg., Nos. 322-323 (1889). *From the Editor.*

"Proceedings of the Zoological Society of London for the year 1889." Part 3; "Abstract of Proceedings, 19th November and 3rd December, 1889." *From the Society.*

"Feuille des Jeunes Naturalistes." No. 230 (December, 1889). *From the Editor.*

"The Melbourne University Calendar." 1881-82; 1884-90 (7 Vols.); "Examination Papers." 1884-89 (25 Parts). *From the University.*

"The Victorian Naturalist." Vol. VI., No. 9 (January, 1890). *From the Field Naturalists' Club of Victoria.*

"The Lichen Flora of Queensland." By John Shirley, B.Sc., F.L.S. *From the Author.*

"Annales de la Société Belge de Microscopie." Tome XIII., Fasc. 1 (1889). *From the Society.*

"Comptes Rendus des Séances de l'Académie des Sciences, Paris." Tome CIX., Nos. 16-20 (1889). *From the Academy.*

"Mémoires de la Société Zoologique de France pour l'Année, 1890." Tome III., Part 1; "Bulletin pour l'Année, 1889." Tome XIV., No. 8. *From the Society.*

Mittheilungen aus der Zoologischen Station zu Neapel." Band IX., Heft 2 (1889). *From the Zoological Station.*

"Bulletin de la Société Royale de Géographie d'Anvers." Tome XIII., Fasc. 4 (1889). *From the Society.*

"Archiv für Naturgeschichte." 55th Jahrg., Band I., Heft 3; Band II., Heft 2 (1889). *From the Editor.*

A Pamphlet entitled "Beiträge zur Anatomie und Ontogenie der Nematoden." Von. N. A. Cobb. *From the Author.*

"The Australasian Journal of Pharmacy." Vol. V., No. 49 (January, 1890). *From the Editor.*

"Mémoires de l'Académie Impériale des Sciences de St. Pétersbourg." VII^{me} Série. Tome XXXVI., Nos. 12 and 13 (1888-89). *From the Academy.*

"Mittheilungen aus dem Naturhistorischen Museum in Hamburg." VI. Jahrg., (1888). *From the Museum.*

"Journal of the Royal Microscopical Society, London, 1889." Part 6. *From the Society.*

"Records of the Geological Survey of India." Vol. XXII., Part 4 (1889). *From the Director.*

"Verslagen en Mededeelingen der Koninklijke Akademie van Wetenschappen." 3rd Reeks, Deel V. (two parts). *From the Academy.*

"Annual Report of the Smithsonian Institution for the year 1886." Part I. *From the Institution.*

"Proceedings of the United States National Museum, Washington." Vol. X. (1887), Sheets 1-37. *From the Museum.*

"Proceedings of the American Philosophical Society, Philadelphia." Vol. XXVI., No. 129 (1889); "Subject Register of Papers, &c.;" "Supplemental Register, &c., 1881-89. *From the Society.*

"Bulletin of the American Museum of Natural History, New York." Vol. II., No. 2 (1889); "Annual Report of the Trustees, &c., 1888-89. *From the Museum.*

"Annals of the New York Academy of Sciences." Vol. IV., Nos. 10 and 11 (1889); "Transactions." Vol. VIII., Nos. 1-4 (1888-89). *From the Academy.*

"Proceedings of the Canadian Institute, Toronto." 3rd Series, Vol. VI., Fasc. 2 (1889); "Annual Report, Session 1887-8." *From the Institute.*

"Reichenbachia.—Orchids Illustrated and Described by F. Sander, &c." Vol. II., Part 8. Also the following Journals, Magazines, &c., for 1889 as published:—"The Athenæum;" "Annals and Magazine of Natural History;" "English Mechanic;" "Entomologist;" "Entomologists' Monthly Magazine;" "The Field;" "Geological Magazine;" "The Ibis;" "Journal of Anatomy and Physiology;" "Journal of Botany;" "Nature;" "Proceedings of the Royal Geographical Society;" "Quarterly Journal of Microscopical Science;" "Science Gossip;" "The Zoologist;" "The Scottish Geographical Magazine." *From Sir William Macleay, F.L.S., &c.*

CONTRIBUTIONS TOWARDS A KNOWLEDGE OF THE COLEOPTERA OF AUSTRALIA.

BY A. SIDNEY OLLIFF, F.E.S.,
ASSISTANT ZOOLOGIST, AUSTRALIAN MUSEUM.

NO. VI.—NEW *LAMELLICORNIA* AND *LONGICORNIA*.

In this paper I have described a few new species which seem to me worth making known from a systematic point of view, either for their individual characteristics, or for geographical reasons. All of them—including the one for which I venture to propose a new genus—have been submitted to my friend Mr. H. W. Bates, who, with his usual kindness, has given me the benefit of his great experience in deciding the position of the more puzzling forms.

LAMELLICORNIA.

OTHNONIUS, gen.nov. (Macrophyllina).

Head rather small; clypeus broad, somewhat concave, nearly semicircular in front, the margin strongly raised, the face beyond the margin sloping almost perpendicularly to the labrum. Labrum prominent and articulated, rather strongly triangularly emarginate in front, with the front angles and sides rounded. Maxillæ short, robust; the inner lobe very narrow; the outer with three irregular rather blunt teeth on the inner margin near the apex. Maxillary palpi with the 1st joint very small, the 2nd and 3rd subtriangular, of nearly equal size, 4th about as long as the three preceding joints together, somewhat narrowed at both extremities. Labium broad, slightly concave, abruptly narrowed at the point of insertion of the palpi, rounded in front. Labial palpi flattened laterally, the

basal joint very small, the 2nd much larger, subtriangular, the 3rd obovate, a little larger than the third. Mandibles solid, horny, and rather sharp at the extremity. Antennæ short, robust, 10-jointed, the club composed of six very long lamellæ which are rather strongly curved outwardly towards the apex; the basal joint short, robust, 2nd about half as long as the 1st, rounded in front, 3rd about twice as long as the 2nd, rather broader in front than behind, 4th short, irregularly triangular, and produced into an angular point externally. Prothorax transverse; anterior margin straight; feebly bisinuate at the base. Scutellum large, rounded behind. Elytra subovate, strongly convex, broader at the base than the prothorax; each with a distinct sutural stria and four pairs of rather obscure striæ which are effaced posteriorly. Pygidium perpendicular. Legs rather long; anterior tibiæ strongly tridentate; slightly incurved, with the apical spine narrow and acute; the intermediate and posterior tibiæ nearly straight, the former a little, and the latter considerably, thickened at the apex, each with a feeble external carina about the middle and an inconspicuous dentation between this and the base; the tarsi longer than the tibiæ; the claws strongly dentate at the base.

This very distinct genus appears to belong to Lacordaire's subtribe *Macrophyllides*, which is chiefly composed of African forms. It has solid horny mandibles, strong toothed maxillæ, prominent and articulated labrum, and distinct ventral segments to the abdomen—all characters approximating it to *Macrophylla* and the allied *Holophylla*; but the form of the antennæ, with their six-jointed club, and the structure of the legs—particularly of the claws—will, I believe, suffice to distinguish it from any genus at present recorded.

OTTHONIUS BATESII, sp.n.

Elongate-ovate, rather strongly convex, somewhat shining; head, prothorax, scutellum, pygidium and legs piceous; antennæ testaceous, except the first two joints which are reddish brown; elytra reddish castaneous.

Head finely and moderately closely rugulose-punctate at the base, sparingly punctured in front, almost impunctate in the middle. Prothorax broadly transverse, the punctuation strong and moderately close, inclining to rugosity near the anterior margin; the sides moderately strongly reflexed, nearly straight for rather more than one half their length, then obliquely narrowed to the anterior margin. Scutellum sparingly and not very strongly punctured. Elytra nearly twice as long as the head and prothorax together, moderately strongly rugulose-punctate, with the two lateral pairs of striæ indistinct, and the interstices broad, the first (that between the suture and the first pair of striæ) very broad at the base and narrowed posteriorly; the shoulders somewhat prominent. Beneath the sterna are thickly clothed with long decumbent grey pubescence; the abdomen pitchy, and very finely punctured, the sides and the dorsal surface reddish. Length 16-18 mm.

Wilcannia, Mossgiel, Walgett, and Clarence River, N. S. Wales.

This species is occasionally found in vast numbers in the dry plain country in the Western division of the colony, flying by day, and usually in the hot sunshine. All the specimens which have come under my observation appear to belong to one sex—presumably the male—as they present no differences in size or structure.

LONGICORNIA.

NOTHOPHYSIS BARNARDI, sp.n.

Elongate, sub-parallel, reddish castaneous, somewhat shining; sparingly clothed with fine yellowish pubescence; antennæ very robust, thickly clothed with fine yellowish pubescence; head and prothorax strongly and sparingly punctured; elytra very strongly and moderately closely punctured above, less strongly and more closely punctured near the sides, with the costæ indistinct.

Head more strongly punctured between the eyes than in front or behind, with an abbreviated median line; mandibles very

prominent, incurved, strongly and sparingly punctured. Antennae about as long as the prothorax and elytra together, robust, somewhat flattened; the third joint nearly as long as the first, the succeeding joints slightly increasing in length towards the apex, the terminal one longer and a trifle narrower than the rest. Prothorax broadly transverse, slightly narrower in front than behind, strongly, irregularly, and sparingly punctured on the disc, a little more strongly and closely punctured near the posterior angles; anterior margin gently sinuate on each side; the sides rather strongly reflexed and strongly produced just before the middle, narrowed obliquely both before and behind this production; the posterior margin feebly bisinuate. Scutellum rounded behind, rather strongly punctured. Elytra at the base broader than the prothorax, parallel-sided, arcuately rounded posteriorly, very strongly, irregularly, and not very closely punctured on the disc, the punctuation inclining to rugosity beyond the middle and near the sides; each with two very indistinct costae on the disc which are entirely effaced about three-fourths from the base; the suture somewhat raised. Underside moderately thickly covered with fine testaceous pubescence; abdominal segments finely punctured. Legs thickly clothed with reddish-yellow pubescence, rather closely punctured; the spongy undersurface of the first three joints of the tarsi testaceous. Length 17-20 mm.

Duaringa, Dawson River, Queensland (G. Barnard).

Allied to *Nothophysa lucanoides*, Serv., from South Australia, but distinguished by its more convex and rather more strongly punctured elytra (of which the costae are less strongly raised), and by the greater space between the eyes.

MONOHAMMUS AESTHETICUS, sp.n.

Elongate, densely covered with umber-brown pile, head with a distinct median line, somewhat impressed between the antennae; prothorax with the lateral spines prominent and acute, strongly and sparingly punctured on the disc on either side of the middle;

elytra moderately strongly and sparingly punctured for the basal two-thirds, scarcely punctate posteriorly.

Head impunctate. Antennæ in both sexes more than twice as long as the body, rather closely pubescent, gradually attenuated towards the extremity; the first joint very robust, and thickened towards the apex, where it is somewhat produced outwardly and obliquely cut off above; 2nd joint more than one and a-half times as long as the first; apical joint about as long as the two preceding joints together. Prothorax transverse, with two impressed lines near the anterior margin, and two near the posterior margin, the former interrupted in the middle, the punctuation confined to the disc on either side of the middle. Scutellum rounded behind, impunctate. Elytra considerably narrowed posteriorly, rounded at the apex, sparingly and moderately strongly punctured near the base, the punctuation gradually decreasing in strength posteriorly, effaced beyond the basal two-thirds. Under-side densely clothed with umber-brown pubescence like the upper surface, except the head, prosternum, and the inner side of the anterior femora, which are pitchy and scantily furnished with fine grey pubescence. Legs with the femora rather closely pubescent, the pubescence inclining to grey above; tibiæ with dense outstanding pile towards the apex. Length, ♂ 29 mm.; ♀ 32 mm.

Cloncurry, Queensland.

A very fine and distinct species quite unlike any of those known to me, but evidently belonging to the *Monohammus fistulator* group. The sexes only appear to differ in the length of the antennæ, those of the male being somewhat longer than those of the other sex.

MONOHAMMUS ARTIUS, sp.n.

Elongate-ovate, densely covered with ashy-grey pubescence; head with a few scattered punctures in front between the antennæ, and a few on each side of the median line behind the eyes; prothorax with the lateral spines strongly produced, rather blunt; elytra sparingly punctured throughout.

Antennæ densely pubescent, in the male about one and a-half times as long as the body ; 1st joint enlarged, similar in form to that of the preceding species, but not so much produced outwardly at the apex. Prothorax transverse, a few scattered punctures on either side of the middle, with two anterior and two posterior transverse impressed lines, the two former interrupted in the middle, and all, except that nearest the posterior margin, somewhat obscure. Scutellum rounded behind, impunctate. Elytra considerably narrowed behind, rounded at the apex, the punctuation gradually decreasing in strength posteriorly. Underside and legs strongly pubescent. Length, ♂ 21 mm. ; ♀ 24 mm.

Cape York (Powell), Duaringa (G. Barnard), Queensland.

This species belongs to the group of the genus in which the antennæ do not exceed the length of the body by more than about one half its length. It is most nearly allied to *M. argentatus*, Hope, but it has not the same silky appearance, and the antennæ are more densely pubescent. The head is also much less punctured behind the eyes, and the lateral spines on the prothorax are less prominent.

RHYTIPHORA ROSEI, sp.n.

Elongate, nearly parallel-sided, piceous, very densely clothed with silvery-grey, almost white, pile ; prothorax with transverse bands of pile ; elytra irrorated with black and white.

Head piceous, irregularly and not very closely punctured, rugulose between the eyes ; the face, a narrow circle round the eyes, and an oblique stripe on each side, silvery-white ; median line distinct. Antennæ a little longer than the body, each joint (except the basal, which is wholly piceous) thickly clothed with silvery-grey pubescence at the base, and with black pubescence at the apex, the grey pile decreasing in extent, joint by joint, towards the apex. Prothorax piceous, rather strongly transversely strigose, with a few punctures on the disc, banded transversely with silvery-grey, the sides wholly grey. Scutellum elongate, rounded behind, inconspicuously punctured. Elytra very convex, the apex rounded, with a few large irregular

tubercles near the base ; the silvery-grey pile arranged in irregular longitudinal lines, the intervals exposing the piceous derm often confluent, and forming irregular oblique lines ; near the apex, and near the suture behind the middle, the pile is only ornamented with minute spot-like interruptions. Underside thickly clothed with silvery-grey pile, the second and third abdominal segments densely covered with ochreous pile. Legs rather robust, densely pilose, the innerside of the anterior tibiæ piceous. Length 32 mm.

Coonamble, New South Wales (J. H. Rose).

A beautiful species, perhaps most nearly allied to *Rhytiphora cretata*, Pasc., but quite unlike any known form in colour and marking.

NOTES AND EXHIBITS.

Mr. Skuse exhibited fine specimens of the following gigantic Tipulidæ—*Semnotes imperatoria*, Westw., and *Semnotes ducalis*, Westw., both of which species are now known to occur in the vicinity of Sydney, the former having been taken by Mr. G. Masters, at Lane Cove, and the latter recently by Mr. H. Prince, at Fairy Bower, near Manly : and a very distinct undescribed species of *Leptotarsus*, Guérin, captured by Mr. Prince last September, at Lawson, Blue Mountains, which for length of limb is the largest of known Australian Diptera.

Mr. Froggatt exhibited a collection of beetles belonging to the genus *Paropsis*, amounting to about 33 species. The specimens were recently collected by Mr. Baeuerlen in the neighbourhood of Mount Dromedary, N.S.W.

WEDNESDAY, 26TH FEBRUARY, 1890.

The President, Professor Stephens, M.A., F.G.S., in the Chair.

Mr. W. D. Filmer, West Maitland, was elected a member of the Society.

DONATIONS.

"The Chemist and Druggist." Vol. XXXV., Nos. 503 and 505 (December, 1889); "The Chemist and Druggist of Australasia." Vol. V., No. 1 (January, 1890). *From the Publisher.*

A Pamphlet entitled "A New British Hepatic." By W. H. Pearson. *From the Author.*

"Annual Report of the South Australian School of Mines and Industries and Technological Museum, 1889." *From the Council.*

"The Journal of the College of Science, Imperial University, Japan." Vol. III., Part 3 (1889). *From the President.*

"Comptes Rendus des Séances de l'Académie des Sciences, Paris." Tome CIX., Nos. 14, 15, 21-25 (1889). "Tables des Comptes Rendus des Séances de l'Académie des Sciences, Paris." Premier Semestre, 1889. Tome CVIII. *From the Academy.*

"Mémoires de la Société Zoologique de France pour l'Année 1889." Tome II., Part 1; "Bulletin." Tome XIV., Nos. 7 and 9 (July and November, 1889). *From the Society.*

"Feuille des Jeunes Naturalistes." No. 231 (Jan., 1890); "Catalogue de la Bibliothèque." Fasc. No. 7 (1889). *From the Editor.*

"Bulletin de la Société Impériale des Naturalistes de Moscou." Année 1889. No. 2. *From the Society.*

"The American Naturalist." Vol. XXIII., Nos. 271 and 272 (July and August, 1889). *From the Editors.*

"The Journal of Comparative Medicine and Veterinary Archives." Vol. XI., No. 1 (Jan., 1890). *From the Editor.*

"Bulletin of the American Museum of Natural History." Vol. II., No. 3, three sheets (pp. 197-244). *From the Museum.*

"Proceedings of the United States National Museum." Vol. XI. (1888), title-page and index. *From the Museum.*

"Zoologischer Anzeiger." XII. Jahrg., Nos. 324 and 325 (1889-90). *From the Editor.*

"Illustrations of Typical Specimens of Lepidoptera Heterocera in the British Museum." Part VII. (1889). By A. G. Butler. *From the Trustees.*

"Annales de la Société Royale Malacologique de Belgique." Tome XXIII. (1888); "Procès Verbaux." July, 1888 to July, 1889. *From the Society.*

"Acta Societatis pro Fauna et Flora Fennica." Vol. V., Part 1 (1888); "Meddelanden." Vol. XV. (1888-89); also two Pamphlets, "Herbarium Musei Fennici." Second Edition. Part I.; and "Notæ Conspectus Florae Fennicae." *From the Society.*

"Proceedings of the Royal Physical Society, Edinburgh." Session 1888-89. Vol. X., Part 1. *From the Society.*

"Annalen des k.k. Naturhistorischen Hofmuseums, Wien." Band IV., Nos. 2-4 (1889-90). *From the Museum.*

"Bericht über die Senckenbergische naturforschende Gesellschaft in Frankfurt am Main, 1889." *From the Society.*

"Bihang till Kongl. Svenska Vetenskaps-Akademiens Handlingar." Zoology—Ser. 4, Vols. XII. and XIII. ; Botany—Ser. 3, Vols. XII. and XIII. *From the Academy.*

"The Transactions of the Entomological Society of London for the year 1889." Part IV. *From the Society.*

"Entomologisk Tidskrift." Arg. X., Häfta 2-4 (1889). *De la part de la Société Entomologique de Stockholm.*

"L'Académie Royale de Copenhague.—Bulletin pour 1889." No. 2. *From the Academy.*

"Abhandlungen herausgegeben vom naturwissenschaftlichen Vereine zu Bremen." Band I.-VII. (1866-82). *From the Society.*

"Verhandlungen der Gesellschaft für Erdkunde zu Berlin." Band XVI., No. 9 (1889). *From the Society.*

DESCRIPTIONS OF HITHERTO UNRECORDED AUSTRALIAN PLANTS, WITH ADDITIONAL PHYTO-GEOGRAPHIC NOTES.

BY BARON VON MUELLER, K.C.M.G., M. & PH.D., F.R.S.

BORONIA ADAMSIANA.

Vestiture extensive, consisting of copious soft partly spreading hairlets; leaves small, trifoliate, sessile; leaflets devoid of stalklets, from ovate- to lanceolar-elliptic, flat; flowers axillary, solitary, on very short and thin pedicels; sepals nearly as long as the petals, much invested with hairlets, broad-linear towards the base, gradually narrowed upwards, acute at end; petals contiguous at the margin before expansion, pale-red, outside much beset with soft hairlets; filaments bearing hairlets rather scantily, suddenly pointed at the apex; anthers pale, cordate, minutely apiculate; style thin, very short; stigma minute; ovularies glabrous.

In the eastern interior of West Australia, at Mangowine, with *Cyanostegia Turczaninowii*; Miss A. Adams.

Height of plant unknown. Leaves copious. Leaflets soft, $\frac{1}{4}$ – $\frac{1}{2}$ inch long. Petals measuring hardly more than $\frac{1}{8}$ inch in length. Fruit as yet not obtained. This probably rare species stands in nearest relationship to *B. ternata*, but in that plant the indument is very short, the leaflets are smaller, the sepals are broader and conspicuously shorter, while the petals are less pointed and on the inner side less glabrous; the fruits of the two may also be different. *B. ternata*, which was not refound since Capt. Roe gathered it more than half a century ago, has recently been obtained near Yilgarn by Messrs. H. S. King and De Courcy Lefroy, during surveys under order of the Hon. John Forrest. Thus now to Endlicher's description, given in 1839, may be added: Anthers

ovate- or cordate-roundish, pale; style extremely short and thin; stigma minute.

Various other congeners have recently been got from new localities—thus :—

Boronia Barkeriana, Jervis Bay (Baeuerlen); Shoalhaven (Rev. R. Collie); Govett's-Leap (Rev. Dr. Woolls).

B. algida, Clyde (Baeuerlen).

B. microphylla, Mudgee (Rev. Dr. Woolls).

B. Edwardii, Kangaroo-Island (Tepper); sepals ovate-lanceolar, much shorter than the petals; filaments slightly rough, thickened upwards; stigma yellow, almost sessile; ovaries bearing a very thin vestiture.

B. falcifolia, Richmond-River (Chandler).

B. serrulata, Wagga-Wagga (Rev. R. Thom).

B. crenulata, Sharks-Bay (Maitl. Brown).

B. ledifolia, Clyde (Baeuerlen), the variety *triphylla*; Culgoa (Hickey), a var. with somewhat denticulated leaflets; Cobar (H. Andrae).

B. heterophylla, Western Mt. Lindsay (Webb); flowers fragrant.

The *B. pteropoda* and *B. lepidota*, described from W.A. specimens by Turczaninow in "Bulletin de la Société impériale des Naturalistes de Moscou," 1863, pp. 595-596 have not yet been identified.

PORTULACA CYCLOPHYLLA.

Glabrous; leaves small, opposite, short-stalked, orbicular, occasionally verging into a somewhat ovate form; flowers comparatively large; sepals almost ovate, hardly as long as the pedicel, twice or thrice as long as the four hypocalyne elliptic- or spatular-cuneate bracts; petals five or six, bright-yellow, ovate-elliptical, doubly as long as the calyx; stamens numerous, disconnected, the longest of these reaching to the middle of the petals; anthers almost ellipsoid, but somewhat truncated or slightly bilobed; pollen-grains spherical, smooth, rupturing; styles connate to near

the stigmas and much longer than these, exceeding most of the stamens ; fruit capsular, rather small, depressed-globular, dehiscent above the middle ; seeds about twelve, nearly lenticular, outside smooth.

At Beringarra in subtropic Western Australia ; W. E. Mossingham.

Stems only a few inches long, as well as the branches slightly reddish, not angular. Root probably annual. Well developed leaves measuring $\frac{1}{4}$ - $\frac{1}{2}$ inch, all flat. Sepals yellowish towards the margin. Petals about half an inch long, rounded-blunt. Filaments and stigmas intensely yellow. Anthers sulphur-coloured. Diameter of fruit hardly $\frac{1}{4}$ inch ; operculum slightly pyramidal. Seeds measuring about $\frac{1}{10}$ inch.

The aborigines of the locality call this plant "Combarra," they doubtless using it for food. It is quite showy. To some extent this species combines the leaves of *P. bicolor* with the flowers of *P. oleracea*, though the coalition of the styles renders this congener at once very distinct. From *P. Armitii* by the colour and disconnectedness of the petals, multitude of stamens and shortness of the operculum it is rendered quite distinct. The dissimilarity of *P. quadrifida* is still greater.

Gunnia Drummondii has recently been sent from the vicinity of Mt. Moore by Mr. Edwin Merrall ; it seems however only a form of the original *G. septifraga* ; the latter was gathered in 1889 by Mrs. Irvine near the Barrier-Range. *Mollugo stricta* was found by Madame A. Dietrich on the Pioneer-River. *M. cerviana* occurs on the Gascoyne-River (Bunbury), Upper Darling-River (Edw. Ramsay), on the Finke-River (Rev. H. Kempe). It is fruiting occasionally at the height of only one inch. *Tetragonia expansa* extends to Esperance-Bay (Dempster). *Aizoon quadrifidum* has been gathered at Eucla by Mr. J. Oliver. *Sesuvium portulacastrum* is now also known from Trinity-Bay (Sayer), Macarthur-River (Lieut. Dittrich), Port Darwin (Holtze). *Trianthema decandra* and *T. pilosa* grow on the Finke-River (Rev. H. Kempe) and on the Gascoyne-River (Hon. J. Forrest). *T.*

rhynchocalyptra was brought from the Flinders-River by Mr. Landsborough, *T. cypseloides* from near the Gilbert-River by Mr. Th. Gulliver. *Macarthuria apetala* was gathered by Mr. Holtze on the Alligator-River, but there the plant is unusually tall and has shorter filaments. *M. Neo-Cambrica* was sent from the Endeavour-River by Mr. Persieh.

ACACIA MERRALLII.

Glabrous; branchlets slightly pruinous; phyllodia small, almost sessile, greyish-green, of firm consistence, orbicular-ovate and somewhat cuneate, inequilateral, prominently margined, all their venules faint, the apex rather lateral, sharp-pointed; glandule inconspicuous, much supra-basal; peduncles about as long as the phyllodia, solitary, axillary, bearing single headlets of flowers; fruits small, much curved or quite twisted, very slender, somewhat contracted between the seeds, rather convex on both sides; seeds ellipsoid, placed longitudinally, the areola on each side minute; arillus bright-yellow, almost semi-ovate, of fully half the size of the seed and often broader.

Yilgarn, near Lake Brown; Edwin Merrall.

The plant, so far as can be judged, while flowers are yet wanting, is distinguishable from *A. obliqua* already in broader and paler phyllodia, stronger peduncles, less curved fruits, more intensely coloured aril of comparatively larger size and of different position. In carpologic characteristics it comes rather near *A. ericifolia*.

Acacia alata, northward to the Greenough-River (Jones).

A. triptera, Darling-Downs (Lau); Cobar (Rev. J. M. Curran).

A. Peuce, Mueller-River near the Bluff, lat. 25° 45' (Alfred Henry).

A. lanigera, Kangaroo-Island (Tepper); it includes *A. venulosa* and *A. Whanii*. Bentham placed the fruit of *A. Oswaldi* with *A. lanigera*.

A. rupicola, Kangaroo-Island (Tepper).

A. conferta, Lake Elphinstone (Mrs. Dietrich).

A. stricta, Mt. Dromedary (Reader); Cambewarra (Baeuerlen); height up to 20 feet.

A. fasciculifera, Severn (Hartmann). Fruit of *A. macradenia*, described in the Flora Australiensis belongs to *A. fasciculifera*.

A. penninervis, the funicle extends sometimes unilaterally, sometimes bilaterally.

A. microbotrya, Stirling's Range (Maxwell).

A. pycnophylla is the genuine *A. crassiuscula* of Wendland, as already observed by Meissner.

A. subcoerulea, Cape Le Grand (Webb); Israelite-Bay (Miss Brooks).

A. vestita, Gulgong (Dr. Barnard); Delegate-River (Baeuerlen).

A. trineura, near Lake Hindmarsh (D'Alton); height to 20 feet.

A. subporosa, Cann-River (C. French).

A. ixiophylla, Dawson-River (Dr. Bancroft).

A. excelsa, Darling-Downs (Lau); Comet-River (O'Shanesy); also on the Flinders and Herbert-River.

A. binervata, Shoalhaven-R. (Baeuerlen).

A. aneura, Gascoyne-R. (Hon. J. Forrest).

A. auriculiformis, Port Darwin (Holtze); allied to *A. spirorbis* from New Caledonia; height to 40 feet.

A. pruinosa, Hawkesbury-R. (H. Deane).

A. decurrens, Grampians (C. Walter).

A. pubescens, Shoalhaven-R. (Baeuerlen); height to 20 feet; stem only a few inches thick; seeds opaque, black, oval, turgid, about $\frac{1}{4}$ inch long; arillus whitish, cymbiform, pointed, nearly half as long as the seed.

A. pentadenia, Shannon (F.v.M.).

A. obscura, Cape Arid and Gardiner-River (Maxwell); Serpentine-R. (F.v.M.); Drummond No. 167. It may be a variety of *A. strigosa*. Calyx also streaked. Leaflets often revolute at the margin; bracts linear, dilated at the summit and there pubescent.

Albizzia canescens, Mitchell-R., Carpentaria (E. Palmer).

A. pruinosa, Shoalhaven (Baeuerlen).

A. monilifera, Port Darwin (Holtze).

A. grandiflora, Mt. Caromba (Miss E. Thornton). Flowers scented, filaments white towards the base, otherwise crimson or pink.

A. Lebbek, Thursday-Island, from three collectors.

This is an apt opportunity for pointing out, that the genus *Hausemannia*, established 1887 by Schumann in Engler's *Bot. Jahrbuecher*, p. 201, must be reduced to *Albizzia*. In first instance, from imperfect material, simply pinnate leaves were attributed to that genus by its author, who however has corrected this in a publication of 1889 (*Flora von Kaiser Wilhelm's Land*, p. 103), where the leaves are described as doubly pinnate. Not to destroy the dedication, the *H. glabra* should now be called *Albizzia Hausemanni*, the other species, viz., *H. mollis* and *H. brevipes* simply changing the generic name. In the same manner *Affonsea juglandifolia*, *A. comosa* and *A. bullata* become merely transferred to *Inga*. The various extent in plurality of pistils within the genus *Albizzia* has been demonstrated in 1888 in the 13th decade of the "Iconography of Australian Acacias and cognate Genera." If for the species of *Albizzia* bearing flowers with more than one pistil, a generic separation is to be maintained, then the name *Archidendron* would take precedence.

HYDROCOTYLE CORYNOPHORA.

Erect, annual, glabrous; stem and branches thinly filiform; basal leaves small, conspicuously stalked, from orbicular to rhomboid, slightly and bluntly lobed but only towards the summit; stem-leaves diminutive, linear, entire; stipules membranous, broadish, somewhat fringed; peduncles upwards gradually and conspicuously dilated; umbels very small; outer pedicels longer than the flowers; petals pale; anthers pale, almost oval; fruits broader than long; fruitlets on each side elevated by a semicircular

ridgelet, compressed towards the outer margin and there somewhat granular-rough.

Near the eastern sources of Swan River; Miss Alice Eaton.

Height of the whole plant from few to several inches. Root very thin, two to three inches long. Basal leaves few, of only $\frac{1}{4}$ - $\frac{1}{3}$ inch measurement, so far as seen on the only two specimens extant. Peduncles hollow, clubshaped-dilated, finally thickened to $\frac{1}{8}$ inch in diameter at the summit. Petals valvate before expansion. Fruit hardly $\frac{1}{10}$ inch broad.

In every instance, so far as the available material demonstrates, the hollow dilatation of the peduncles occurs; but I found no insects in them, though likely the cavity would be filled with sap while the plant is growing. This remarkable structure reminds of what is seen thus far in *Utricularia tubulata*. The aspect of the plant is that of a *Didiscus* in miniature; but on account of the presence of stipules and want of involucre it seems preferable to place this species in *Hydrocotyle*.

Some difficulty has arisen in the use of the name *Didiscus* for the genus, to which so long and so extensively it was applied. As regards etymology the designation *Trachymene* certainly applies best to *Didiscus albiflorus*, but it is not altogether inapplicable to the two other species, which Rudge at once included in *Trachymene*. As *Siebera* among Compositæ takes by one year precedence over *Siebera* in Umbelliferae, it seems best, to resort again to the older nomenclature by maintaining *Didiscus* for generic appellation. The following are as yet unrecorded localities for Australian Umbelliferae.

Hydrocotyle Javanica, Peel-River (Musson); Edgecombe-Bay (Birch).

H. pedicellosa, Tambourine-Mountains (Scortechini); Pee River (Museum); the leaves attain three inches in diameter.

H. geraniifolia, Hawkesbury-River (Woolls).

H. callicarpa, Hume-River (Jephcott); height to six inches.

H. trachycarpa, Lachlan-River (Andrae).

Didiscus cyanopetalus, Upper Darling-River (Josephson); Mt. Moore (Merrall); occasionally fruiting at a height of only $1\frac{1}{2}$ inches.

D. eriocarpus, Lachlan-River (Andrae).

D. villosus, Cambridge-Gulf (Johnston); Port Darwin (Holtze), there with almost lobeless leaves.

D. pilorus, Clyde (Baeuerlen).

D. glaucifolius, Cooper's Creek (Flirl); Paroo (Mrs. Spencer).

D. glandulosus, King's Sound (Froggatt).

D. albiflorus, Lake Burrill (Baeuerlen).

Trachymene valida, Endeavour-River (Persieh).

T. linearis, Culgoa (Hickey); Shoalhaven (Baeuerlen).

T. Stephensoni, Manly Beach (Siegert).

Xanthosia dissecta, Clyde (Baeuerlen).

X. Atkinsoniana, Mt. Dromedary (Reader).

Actinotus Helianthi, Dubbo (Curran).

A. minor, Jervis-Bay (Baeuerlen).

A. Gibbonsi, Pulpulla (Josephson).

Eryngium rostratum, Culgoa (Hickey).

E. plantagineum, Georgina-River (Dittrich).

Apium leptophyllum, Hume-River (F.v.M.); Endeavour-River (Persieh).

Oreomyrrhis andicola, Upper Macquarie-River (Rev. J. M. Curran).

(To be continued.)

**A REVISION OF THE AUSTRALIAN GENUS *OGYRIS*,
WITH DESCRIPTION OF A NEW SPECIES.**

BY W. H. MISKIN, F.E.S.

So little is known of this exceedingly scarce and limited genus that no excuse is required for reviewing what has been hitherto published upon the subject.

Family LYCÆNIDÆ, *Steph.*

Genus *OGYRIS*, *Westw.*

O. GENOVEVA, *Hew.*

♀. Ex. Butt. I. Og. t. 1, f. 5, 6 (1853); *Miskin*, Trans. Ent. Soc. p. 343, t. xv. (1883); ♂. *O. zosine*, Hew. Ex. Butt. I. Og. t. 1, f. 3, 4 (1853); Cat. Lyc. B.M. t. 1, f. 7 (1862); ♂. *O. damo*, Doubl. Brit. Mus. list.

Hewitson's description of ♂ *Abrota* (Ex. Butt. I. Og. t. 1), which he makes = *Damo*, (Doubl.), is clearly intended for the ♂ of this species, a description of which I gave in Trans. Ent. Soc. as above. Singularly Hewitson's description does not agree with his figure of ♂ *Abrota*.

O. OTANES, *Feld.*

Reise Nov. Lep. II. p. 217, n. 234, t. 28, f. 1-3 (1865); *Tepper*, Trans. Roy. Soc. S. Aust. Vol. IV. p. 31, t. II. f. 1 (1882).

I have not seen specimens of this species; I am half inclined to think it may prove to be a smaller form of *Genoveva*, coming as it

does from a more southerly latitude (Adelaide). Felder's figures would do for the ♂, and the dark violet form of the ♀.

O. ORONTAS, *Hew.*

Cat. Lyc. B.M. p. 2, n. 9, t. 1, f. 8, 9 (1862).

Hewitson's figure is of the ♂, not the ♀, as stated. The ♀ is similar to the ♂, rather larger, and with a dull white sub-apical patch. Specimens of both sexes are contained in the collection of the Australian Museum, Sydney. This species is, next to *Genoveva*, the largest of the genus.

O. IDMO, *Hew.*

Cat. Lyc. B.M. p. 2, n. 7, t. 1, f. 3, 4 (1862).

Hewitson's figure and description is of the ♀.

♂. **UPPERSIDE**.—Uniform brown with slight purplish hue, narrowly margined outwardly with black; fringes white, alternated with black spots. **UNDERSIDE**.—*Primaries*: Discal and disco-cellular areas black; base of wing, costal border, and apical areas light grey; rest of wing darker grey; a double silvery-blue short transverse band within and at about middle of cell; another arched one also within and near end of cell; a broad very light band beyond end of cell, reaching from costa to first median branch; a light brown submarginal macular line from apex not reaching to hinder angle. *Secondaries*: Light grey, rather darker at base, and crossed transversely with numerous parallel waving dark brown lines. Thorax and abdomen, above and beneath, dark brown.

Exp. 52 mm. My ♀'s are 48 and 52 mm., respectively.

My specimens are from South Australia and Victoria. Hewitson gives Swan River as the habitat; it must consequently have a wide range.

O. ABROTA, *Doubl. and Hew.*

♀. Gen. D.L. t. 75, f. 8 (1852); ♂. *Hew. Ex. Butt.* I. Og. t. 1, f. 1, 2 (1853); *O. catharina*, Feld. Reise Nov. Lep. II. p. 218, n. 235 (1865).

The ♀ of this species is figured in the Gen. D.L., and described in *Hew. Ex. Butt.* The ♂ is figured in *Ex. Butt.*, but the description given does not correspond with the figure, but applies to ♂ *Genoveva*. See remarks on that species, *supra*. I append description.

♂. UPPERSIDE.—Dense purple; costa narrowly black; outer margins of both wings with a distinct somewhat narrow black border; abdominal margin of secondaries brown. UNDERSIDE.—*Primaries*: Very dark brown; hinder area somewhat lighter; apical area light grey; four short transverse bluish-white lines within the cell at equal distances apart; a nearly round bluish spot at end of cell. *Secondaries*: Light greyish-brown; two irregular transverse dark brown basal bands; rest of wing traversed by numerous indistinct brown waved lines. Thorax and abdomen, above black, beneath greyish-brown.

Exp. 45 mm.

My ♂ specimen is from Sydney, ♀'s from Victoria.

O. OROETES, *Hew.*

Cat. Lyc. B.M. p. 3, n. 12, t. 1, f. 12, 13 (1862).

Hewitson's figure is of the ♀. I append description of the other sex.

♂. UPPERSIDE.—Uniform brilliant shining morpho blue, with costal and outer marginal black line, rather wider at apex, in primaries; outer marginal black line in secondaries. UNDERSIDE.—As in Hewitson's figure, but the ground colour much darker, and the three first transverse discal bands blue instead of

white. The outer border of secondaries scalloped, and the nervules terminated in tufts of black hairs; extremity of fringe white. Thorax and abdomen, above dark brown, beneath dark grey.

Exp. 41 mm.

I have specimens of the ♂ from W. Australia, Victoria, and Keppell Bay (Queensland), showing a wide distribution; the ♀ must be excessively scarce, as I have seen but one specimen, that in the Australian Museum at Sydney, with which Hewitson's figure and description agree pretty well.

O. AMARYLLIS, *Hew.*

Cat. Lyc. B.M. p. 3, n. 11, t. 1, f. 5, 6 (1862).

The figure and description is of the ♀; the male is undescribed.

♂. **UPPERSIDE**.—Light shining blue with dark brown marginal bands. *Primaries*: Costal and outer margins moderately wide, the latter continued well round hinder angle; a short transverse band at termination of cell. *Secondaries*: With a narrow outer marginal band except at apex, where it is wider; marginal border extending inwardly between each of the veins in sharp triangular points. **UNDERSIDE** agrees pretty well with Hewitson's figure; it is however rather darker, and all the light transverse discal bands in primaries are bright metallic blue, and the scarlet bands are bordered with the same colour. Thorax and abdomen, above dark brown, beneath dark grey.

Exp. 44 mm.

I have one specimen in my collection taken, I believe, in Brisbane. I only know the species otherwise as Victorian; the ♂'s, as in the preceding species, appear fairly common, while the opposite sex is peculiar by its scarcity; the only ♀ specimen I

have seen is in the collection of the Australian Museum at Sydney ; in this example the dark marginal bands are even more developed than in Hewitson's figure.

O. OLANE, *Hew.*

Cat. Lyc. B.M. p. 2, n. 10, t. 1, f. 10, 11 (1862).

Hewitson's figure and description evidently represent the ♀, although the blue is shown as extending rather too much into the wing, but the colour agrees well.

The blue of the ♂ is much darker and its area more extended, and more sharply defined at its edges. This sex expands from 35 to 40 mm.

I know the species as from Victoria only.

O. BARNARDI, n.sp.

♂. **UPPERSIDE**.—Uniform dark purple ; outer borders of both wings narrowly margined with dark brown ; abdominal margin of secondaries light brown ; two small white dashes on extreme costal edge near apex. **UNDERSIDE**.—*Primaries* : Light reddish-brown ; discal region darker, almost black in centre ; four short transverse bands nearly equidistant within the cell, the two basal ones—which are least—white, the other two bright silvery-blue, the last not quite at end of cell ; beyond end of cell another light blue band ; apex light grey, developing into two bands further down wing, the first narrowing to a point reaching about middle, the other submarginal, narrow, not quite reaching hinder angle. *Secondaries* : Light grey, with light brown, broken, transverse bands, marked at edges in black ; these comprise a basal one, a subbasal, a central very irregular one, and an outer curved one, a submarginal row of black points from anal angle to apex. Thorax and abdomen, above black, beneath light grey.

♀ as in ♂, but with the purple area, which is lighter in colour, more circumscribed, thus producing wide, especially costal, apical, and outer brown borders ; otherwise the same.

Exp. ♂ 34 mm. ; ♀ 40 mm.

Hab.—Dawson River (Queensland).

This species approaches somewhat nearly to *Olans*, and in fact it was only after acquiring long series of specimens, and finding that no variation whatever occurred, that I was convinced of its specific distinction. I am indebted to my friend Mr. Geo. Barnard for my specimens, after whom I have much pleasure in naming the species.

DESCRIPTIONS OF HITHERTO UNDESCRIBED AUS-
TRALIAN LEPIDOPTERA (RHOPALOCERA)
PRINCIPALLY LYCÆNIDÆ.

By W. H. MISKIN, F.E.S.

Fam. NYMPHALIDÆ, Swain.

Subfam. SATYRINÆ, Bates.

Genus MYCALESIS, Hub.

M. MODESTUS, n.sp.

♂. UPPERSIDE.—Uniform smoky-brown.

UNDERSIDE.—Basal and central areas as above rather lighter ; a light grey line transversely across both wings parallel with outer margin about one third therefrom ; from line to outer margin lilac-grey ; about centre of outer area a transverse row across both wings of small ocelli, black with white centres ringed with light brown ; submarginal double crenulated dark brown line through both wings ; marginal line of black.

♀. UPPERSIDE.—Rather lighter than in ♂ ; outer third of primaries somewhat lighter ; a single ocellus a little below middle near outer margin of primaries ; marginal line in secondaries as in ♂, and a faint indication of two or three almost obsolete ocelli towards anal angle.

UNDERSIDE.—Basal and central areas greyish-brown ; outer third silvery-grey ; otherwise as in ♂, except that ocelli and marginal lines are less developed. Abdomen and thorax, above black, beneath grey.

Ex. ♂ $1\frac{2}{3}$ in.; ♀ 2 in.

Hab.—Cooktown (N. Queensland). Coll. Miskin. This species is near to *infusata* (Macleay).

Fam. LYCÆNIDÆ, Steph.

Genus LUCIA, Swain.

L. LUCANUS, F.

(*Hesp. L.*) Ent. Syst. III. 1, p. 322, n. 221 (1793); *Don.* (*Pap. L.*) Ins. India, t. 43, f. 4 (1800); *Butler* (*Zeritis L.*) B.M. Cat. Fab. Lep. p. 178 (1869); *L. limbaria*, *Swainson* (*nec Blanchard*) Zool. Ill. Ins. II. t. 135 (1833); *Chrysophanus discifer*, *Herr.-Schff.* Stett. Ent. Zeit. p. 72, n. 21, t. 4, f. 21 (1869); *Ex. Schmett.* II. f. 123 (1869); *Semper* (*Zer. D.*) Mus. Godf. XIV. Lep. p. 18 (1878); *Tepper* (*Lyc. D.*) Trans. Roy. Soc. S. Aust. Vol. IV. p. 29, t. 11, f. 14-15 (1882).

As there appears some confusion with respect to this very common species, and the descriptions already published are very incomplete, I give the above synonymy, and append a full description of both sexes. *Swainson's* figure, and *Herrich-Schäffer's* figure in *Ex. Schmett.*, (I have not seen his figure and description in *Stett. Ent. Zeit.*), both represent the ♂. *Rosenstock* (*Ann. N. Hist.* (5), Vol. XVI. p. 377, 1885) describing *L. pyrodiscus*—which latter appears to me to be = *Chrysophanus aurifer*—refers to *limbaria* (*Swains.*) in error, evidently meaning *limbaria* of *Blanchard*, a different insect, which is = *aurifer* of same author—a *Chrysophanus*.

♂. UPPERSIDE.—*Primaries* reddish-brown, with the whole of discal area nearly touching hindmargin and base shining orange; short transverse band of brown at end of cell. *Secondaries* uniform reddish-brown. Fringe of both wings alternately brown and white.

UNDERSIDE.—*Primaries* grey-brown, with darker brown short transverse bands and spots margined with white; discal area ochreous-orange; three short bands within cell, one near base, one at termination, and one midway; a spot below the central band; a transverse somewhat curved row of five short bands or spots from costa, near apex, towards hinder margin but not reaching it; an almost obsolete submarginal row of spots. *Secondaries* grey-brown with darker brown spots generally margined with white, arranged in transverse rows.

♀. UPPERSIDE.—As in ♂, but the brown of more sordid hue and but a very small discal patch of clouded yellow in primaries.

UNDERSIDE.—As in ♂, but all the markings more distinctly defined. Fringes as in ♂. Thorax and abdomen, above dark brown, beneath light grey.

Exp. ♂ 27 mm. ; ♀ 28 mm.

This species has a wide range, being found as far north as Rockhampton and round to Adelaide.

Genus CHRYSOPHANUS, Hub.

C. AURIFER, Blanch.

(*Thecla A.*) Voy. Pôle Sud. t. 3, f. 13-14 (1853); *T. limbaria*, Blanch. l.c. texte p. 400, (1853); Chenu, (*Thecla A.*), Enc. d'Hist. Nat. Pap. p. 280, f. 489 (1869); Butler (*Lyc. A.*), Trans. Ent. Soc. p. 10 (1875); Semp. (*Chry. A.*), Mus. Godff. XIV. Lep. p. 18 (1878); *L. pyrodiscus*, Rosen. Ann. Nat. H. (5), XVI. p. 377 (1885); Newm. ♂ MS. in Brit. Mus.

This species has become so confounded with *L. Lucanus* that it has seemed to me desirable to give a note of the synonymy; and as it is very imperfectly described, a full description of both sexes will avoid future confusion.

♂. UPPERSIDE.—*Primaries* widely margined on all sides with dark brown, outer margin widest; discal area triangularly, not

quite touching base and not encroaching within cell, fiery metallic copper. *Secondaries*, the same, but with the coppery discal area less extensive; a submarginal outer row of faint blue specks, rather larger at anal angle; extreme abdominal margin paler brown; anal angle produced into a short blunt tail; fringe dirty white, of tail reddish-brown.

UNDERSIDE.—Light shining brown, with bands, lines, and specks of lilac-brown. *Primaries* with a speck within the cell at base, a narrow transverse band at middle of cell and another similar one just below this, a similar one at end of cell; a speck immediately above and another below cell, about midway between central and end bands; a wider transverse curved waved band between end of cell and outer margin from costa not quite reaching hind margin, where it is terminated by a single spot; a submarginal row of specks; a large pale yellowish discal patch towards hinder angle. *Secondaries*: a subbasal transverse row of four spots; another row of same number, followed by a widish irregular band; a submarginal double line.

♀.—As in ♂, but with the discal patch in primaries larger paler in colour, not reaching so near to base, but quite touching hind margin, rather ovate in form. *Secondaries* with the copper patch nearly round, small, and near to outer margin; the black outer margin penetrating the copper patch in sharp points; submarginal row of blue specks more developed than in ♂.

UNDERSIDE.—Generally paler in colour than in ♂, all the markings much less distinct; the discal yellow in primaries much more diffused. Contour of both wings in outer margin considerably convex. No tail. Thorax and abdomen, above black, beneath light brown.

Exp. 30 mm.

This species does not seem to extend into Queensland, where it is replaced by an allied species described further on. I have records of it from Newcastle (N.S.W.), Victoria, S. Australia, and Tasmania.

C. *ÆNEA*, n.sp.

♂. UPPERSIDE.—*Primaries* with the costa from the base, increasing in width towards apex and half filling cell, dark purplish-brown; apical region and outer margin very widely occupying nearly a third of wing, the same; rest of wing quite to base and hindmargin, shining golden copper. *Secondaries*: costal and apical area dull brown, rest of wing clouded coppery, with an outer narrow marginal brown border; extreme abdominal border pale brown; anal angle caudate.

UNDERSIDE.—Fine light reddish-brown, with dark brown markings. *Primaries*: a spot near base within cell, and another immediately below this; a double spot about centre of cell, immediately below which are two others transversely; a double spot at end of cell, and two indistinct ones below, and one above; beyond this a transverse row of five heart-shaped spots forming an irregular band; a submarginal rather indistinct broken line. *Secondaries*: a basal row of three spots; a spot about centre of cell, and one immediately above this; a transverse row of marks, sometimes forming spots, sometimes parallel white lines, in an irregular manner, about the middle; beyond this three irregular parallel waved lines, the last submarginal; a marginal irregular indistinct line of ochreous-red, most distinct at tail.

♀. UPPERSIDE.—*Primaries* very much as in ♂, but the coppery discal area not shining, the outer edge of it rounded, corresponding with contour of wing, which is considerably convex; the outer dark margin extending also further along hindmargin. *Secondaries* with the costal and apical brown area extending more into wing; with the anal outer area dull reddish-yellow, extending quite to margin and for about one-third into wing, where it is continued to base only along the nervures, the spaces between being reddish-brown; extreme abdominal margin pale brown; a marginal black line; at anal angle just above line between nervules two black crescent-shaped marks; outer contour extremely convex.

UNDERSIDE.—Light yellowish-brown, with marks as in ♂, but rather less distinct; an orange tinge in disc of primaries. Thorax and abdomen, above black, beneath light grey.

Exp. ♂ 31 mm. ; ♀ 38 mm.

Hab.—Queensland. Coll. Miskin.

This species is well distinguished from *aurifer* by the wholly different position of the coppery areas in all the wings. It appears to be entirely confined to Queensland; I have a specimen from as far north as Bowen.

Genus DANIS, F.

D. SYRIUS, n.sp.

♂. *UPPERSIDE*.—*Primaries* light greyish-blue; costal and outer borders narrowly margined with black; an elongate discal patch of white, from below cell to hinder margin. *Secondaries*: base grey-blue; central portion of wing from border to border transversely broadly white; beyond this greyish-blue; outer border black, narrowly from apex, but increasing in width to anal angle.

UNDERSIDE.—*Primaries*: costal and outer border broadly black, rest of wing white; a blue-grey band within the black from base, where it is widest, curved at apex, then very narrowly towards but not reaching hinder angle. *Secondaries*: basal band of greyish-blue, then a band of black, centre of wing transversely broadly white; outer margin broadly black, within which is a band of greyish-blue, containing a row of black spots placed between the nervules. Fringe of both wings, white alternated with spots of black at termination of nervules. Thorax and abdomen, above light greyish-blue, beneath silvery grey.

♀.—As in ♂ except that the blue is much less pronounced, the upper side being almost black. Thorax and abdomen, above black with slight blue tint, beneath light grey.

Exp. ♂ 45 mm. ; ♀ 47 mm.

Hab.—N. Queensland. Coll. Miskin.

This is near to *Sebae*, and the markings are very similar to that species, but the decidedly different tint of blue, the absence of metallic sheen, and the somewhat larger size seem to sufficiently distinguish it.

Genus LYCÆNA, F.

L. LINEATA, Murray.

♀. Trans. Ent. Soc. L. p. 524, t. x. f. 9 (1874).

♂. UPPERSIDE.—Pale slaty-blue, with whitish silky surface produced by lengthy pubescence; costal margin of primaries and outer margin of both wings narrowly brown.

UNDERSIDE.—Dark brown, the double parallel transverse white lines rather faintly developed; otherwise as described in ♀, except for the discal white patch on primaries. Thorax and abdomen, above black, beneath dark brown.

Exp. 25 mm.

This is questionably distinct from *Palmyra*, Feld. The ♂ seems to have been hitherto unknown.

L. CANESCENS, n.sp.

UPPERSIDE.—Shining brown; base bluish-black.

UNDERSIDE.—Uniform light shining brown, finely speckled with white; a few obscure black spots barely visible sparsely distributed in an irregular manner. Thorax and abdomen, above black, beneath grey.

Exp. 26 mm.

Hab.—Tasmania. Coll. Miskin.

L. MACKAYENSIS, n.sp.

♂. UPPERSIDE.—Uniform lilac-blue, rather darker at base; outer marginal line of black.

UNDERSIDE.—Pale brown, with transverse bands of slightly darker colour, bordered faintly with whitish, but all very obscure.

Primaries with a subbasal band crossing wing; a short one at end of cell; one irregularly curved between this and outer border; a submarginal row of crescent-shaped marks. *Secondaries* with three bands traversing wing at about equal distances; submarginal rows of lunular markings; two black spots with metallic green centres at anal angle. Thorax and abdomen, above black, beneath grey.

Exp. 16 mm.

Hab.—Mackay. Coll. Miskin.

This little species approaches nearest to *biocellata* (Feld.), but is a smaller insect and differs very considerably in the markings of underside.

L. NIGRA, n.sp.

♀. *UPPERSIDE*.—Black; with discal, somewhat oval, patch of pure white below cell and reaching hinder margin in primaries; and in secondaries reaching from centre of cell to costal margin where it meets the patch of primaries.

UNDERSIDE.—Silvery-white. *Primaries* with costal and outer borders margined with light grey-brown; three dark brown marginal spots touching above costal vein, the last being at extremity of that vein and fainter in colour; a small light brown spot about middle of cell; a light brown transverse line at end of cell; a transverse waved line between end of cell and outer margin; a submarginal row of lunular white marks not reaching to apex. *Secondaries* with a transverse row of three black spots equidistant, a short distance from base; another spot upon abdominal margin about half way; another larger one at extreme apex; a faint transverse brown line at end of cell; a transverse broken light brown line beyond cell nearer to outer margin; outer margin light brown, within it a submarginal row of white crescents between the nervules; a small black spot at anal angle, and a larger one between 2nd and 3rd median branches; marginal line light brown. Thorax and abdomen, above black, beneath grey.

Exp. 23 mm.

Hab.—Cardwell. Coll. Miskin.

L. GRACILIS, n.sp.

♂. UPPERSIDE.—Uniform light brown. *Primaries* with a slight violet reflection in hinder area. *Secondaries* with the anal area shot with purplish-blue in some specimens.

UNDERSIDE.—Dull silvery-grey without markings except for a very faint outer submarginal line in primaries; in secondaries a large black spot at border between 2nd and 3rd median branches, another almost obsolete in space next above, other barely discernible ones continued to apical angle.

♀. UPPERSIDE.—Dull purple, with indistinct outer marginal bands of brown. In other respects as in ♂. Thorax above black, abdomen brown; beneath both silvery-grey.

Exp. ♂ 20 mm. ; ♀ 22 mm.

Hab.—Brisbane to Cooktown. Coll. Miskin.

This species is most nearly allied to *pygmæa* (Snell), than which it is somewhat larger.

Dr. Lucas has given a description of this species, appearing in the Proceedings Royal Soc. of Queensland, p. 159 (1889), under the name of *exilis*, but as this name is already preoccupied by an American species of the genus (*Bois. Ann. Soc. Ent. Fr. p. 195, 1852*) it must of course be discarded. I have added description, as the one before referred to is not quite intelligible, and the figures accompanying are worse than useless.

L. SULPITIUS, n.sp.

UPPERSIDE.—Dull dark brown.

UNDERSIDE.—Light brown, with double parallel lines of wide silvery-white, forming transverse bands. *Primaries*: a basal one across wing; a short one at end of cell; a somewhat curved broken one traversing wing between end of cell and outer border, a submarginal white curved line; a marginal line of brown.

38 ON HITHERTO UNDESCRIBED AUSTRALIAN RHOPALOCERA,

Secondaries with a short basal band ; another crossing wing at end of cell, from border to border ; another between the last and outer border, this one increasing in width considerably at middle, its outer line not reaching costal margin ; marginal line black ; two black spots at anal angle, the upper one with a slight crown of red. Fringe brown ; abdomen and thorax, above dark brown, beneath grey.

Exp. 21 mm.

Hab.—Rockhampton. Coll. Miskin.

This species is near *serpentata* (H.-S.).

L. MATHEWI, n.sp.

UPPERSIDE.—Shining dark brown.

UNDERSIDE.—Soft light yellowish-brown ; the transverse bands formed by longitudinally elongate independent spots very faintly margined with white, depicted in dark brown. *Primaries* with a short basal one within cell, and another less distinct below, touching hinder margin ; another short one at end of cell ; another just beyond cell touching both borders ; a submarginal faint waving line : a marginal line of dark brown. *Secondaries* : a subbasal spot near costa ; a row across wing through middle of cell ; a short one at end of cell ; a curved one beyond and touching the last, from border to border ; beyond this a band of white, bordered by a waved brown line, a short distance from border ; a black speck at anal angle, and one or two black crescents upwards along the border, with a slight presence of red above. Fringe inconspicuous light spotted with darker.

Exp. 21 mm.

Hab.—Sydney. Coll. Miskin.

L. HOBARTENSIS, n.sp.

UPPERSIDE.—Shining dark brown ; fringe broad and distinct white alternated at end of nervules with brown.

UNDERSIDE.—*Primaries*: light greyish-brown; the bands of darker brown edged with white; one short one in centre of cell; another short one at end of cell; one complete one beyond cell; a submarginal brown line. *Secondaries*: greyish-brown, the bands and spots very dark brown; a basal spot near costa; a subbasal transverse row of three spots; a short disco-cellular band; a transverse band beyond, but touching the last, considerably elbowed at middle outwardly; a submarginal row of brown spots, crowned with lunules of darker brown; outer area lighter coloured than basal portion. Thorax and abdomen, above dark brown, beneath grey.

Exp. 18 mm.

Hab.—Hobart (Tasmania). Coll. Miskin.

This little species is closely allied to the last-described, but the markings on underside of secondaries are somewhat differently arranged; they both approach in some degree to *agricola* (D. & H.)

For both this and the previous species I am indebted to Mr. Gervase F. Mathew; they have been in my collection for a considerable time unnamed, and as they are irreconcilable with any published descriptions I have now determined to claim on their behalf specific rank.

Genus LYCÆNESTHES, Moore.

L. TURNERI, n.sp.

♂. **UPPERSIDE.**—Uniform dark violet.

UNDERSIDE.—Very pale shining brown, with the usual silvery-white parallel broken lines, forming transverse bands. *Primaries*: a short one at end of cell; another beyond, from costa not quite reaching hinder margin; a submarginal one indistinct. *Secondaries*: one near base across wing; a short one at end of cell; beyond this another from border to border; a submarginal one, lunulate; between 2nd and 3rd median branches a black spot crowned with orange-red on border; marginal fine black line.

♀. **UPPERSIDE.**—*Primaries*: basal and discal areas to hinder margin, light violet; costal margin not widely and outer margin widely, black; a round spot of white just outside of and below end of cell. *Secondaries*: light violet, with the outer margin black, within which latter is a submarginal row of violet lunular marks, then a faint violet line, the extreme margin narrowly black.

UNDERSIDE.—As in ♂, except that in primaries the discal area but for the bands is white; abdominal margin light brown. Caudal fascicles three, instead of two as in ♂. Thorax and abdomen, above bluish-black, beneath light grey.

Exp. ♂ 30 mm.; ♀ 25 mm.

Hab.—Cape York, Cardwell, Mackay. Coll. Miskin.

I have named this species after Mr. Rowland E. Turner, of Mackay, who has been good enough to present me with a specimen of each sex from his locality, my previous specimens being in poor condition.

L. TASMANICUS, n.sp.

♂. **UPPERSIDE.**—Uniform lilac-blue. *Primaries* with the apex narrowly margined with black. *Secondaries* with two small submarginal patches of black at anal angle.

UNDERSIDE.—Light sienna-brown, with transverse bands of dark reddish-brown, edged on each side with white; base of both wings dark brown. *Primaries* with a subbasal band, not extending quite to hinder margin; a short band at end of cell; between this and outer margin another, irregular in form across wing; a waved submarginal narrow indistinct one; a whitish margin, and a faint marginal line of brown. *Secondaries*: a subbasal band coalescing with brown of base; a central wide very irregular one; a submarginal waved brown line; a white margin and a marginal brown line; two black spots with metallic green centres at anal angle. Fringe white interrupted with brown spots. Thorax and abdomen, dark brown above and beneath.

Exp. 30 mm.

Hab.—Tasmania. Coll. Miskin.

Genus HOLOCHILA, Feld.

H. ANDRODUS, n.sp.

♂. UPPERSIDE.—Light greenish-blue; fine marginal line of black.

UNDERSIDE.—Silvery snow-white; three marginal very small black specks, from anal angle outwards.

♀. UPPERSIDE.—Dull black, with a very slight indication of blue at base; discal area circularly white, not touching hinder margin in primaries. *Secondaries* with a round white patch at apical region, extending in a point somewhat towards base; with five black marginal points on underside of secondaries. Thorax and abdomen, above black, beneath white.

Exp. 32 mm.

Hab.—Cape York, Cooktown. Coll. Miskin.

Nearly allied to *absimilis* (Feld.).

Genus IALMENUS, Hub.

I. ITONUS, n.sp.

♂. UPPERSIDE.—Dark brown; discal area metallic greenish-blue. *Primaries* with the discal metallic patch digitate on outer edge, and nearly touching hinder margin; a black short transverse band at end of cell. *Secondaries* with the metallic patch nearly touching base, and crossed near outer border by an irregular transverse dark brown line; at anal angle a black spot crowned with orange-red; between submedian and last median branch a black patch surmounted by a white line; between 2nd and 3rd submedian branches a round black spot deeply surmounted with orange-red; from this to apical angle a submarginal row of white spots; a marginal white line from anal to apical angle; abdominal margin clothed with long hairs, light brown; tail black tipped with white.

UNDERSIDE.—Silvery-grey, with transverse narrow black bands and spots, the position and form of which are almost as in *Ictinus*, and nearly as wide as in the light-banded form of that species; the submarginal band being light brown and distinct, the marginal band orange-brown as in *Evagoras*. *Secondaries* with an outer submarginal row of white spots. Thorax and abdomen, above dark brown, beneath silvery-grey.

Exp. 36 mm.

Hab.—Cape York. Coll. Miskin.

This species is very close to *Ictinus* (Hew.); it is distinguished from it however by the different form of the discal metallic blue area, also by the submarginal rows of white spots on secondaries above and beneath, and by the colour of the underside, as well as by the minor differences referred to in the description.

Genus AMBLYPODIA, Horaf.

A. EUPOLIS, n.sp.

♂. **UPPERSIDE.**—Uniform dull violet, base of abdominal margin in secondaries greyish.

UNDERSIDE.—Pale olive brown with transverse bands and spots of darker brown bordered or surrounded narrowly with whitish. *Primaries*: a spot and two short transverse bands within the cell, at equal distances from one another and from the base, the first smallest near to base, the larger at end of cell, the other intermediate in size; immediately below disco-cellular band another longitudinally, and below this towards base another short transverse one rather indistinct; beyond all these at about two-thirds a broad transverse band from costa not reaching submedian; an indistinct narrow submarginal band. *Secondaries* with a slight lilac bloom; two round spots near base transversely; a transverse curved row of four small spots across wing; a very broad irregularly edged transverse band from costa to abdominal margin, nearly straight to last median branch, then narrow and curved to margin, touching at centre a short disco-cellular band; below this last-mentioned

band towards termination of principal band are two spots; a submarginal rather indistinct band; a marginal band rather darker; a black spot at anal angle crowned with silvery-blue, from this to second median branch a border of light metallic-blue: tail tipped with black with white point.

♀. UPPERSIDE.—*Primaries*: shining violet, blue at base; costa brown at base narrowly to about one-third, increasing in width to apex which is widely, and outer margin less widely, dark brown. *Secondaries*: the same; apex widely, outer margin very narrowly, dark brown; abdominal margin at base light brown; anal angle broadly dark brown. Thorax and abdomen, above dark brown, beneath pale brown.

Exp. ♂ 44-48 mm.; ♀ 40-48 mm.

Hab.—Cape York, Cooktown, Cardwell. Coll. Miskin.

A. CYRONTHE, n.sp.

♂. UPPERSIDE.—Uniform dense purple, with slight violet reflection; costal and outer margins bordered very narrowly with black; abdominal margin of secondaries broadly light brown, and clothed with long hairs.

UNDERSIDE.—Exactly as in *Amytis* (Hew.). Thorax and abdomen, above dark brown, beneath yellowish-brown.

Exp. 45-53 mm.

Hab.—Cape York, Bowen. Coll. Miskin.

I have hitherto hesitated to describe this species on account of the strong similarity in colour and marking of underside to *Amytis*, but the colour is so different on the upperside to that species, of which latter I have collected large numbers, that I have determined after waiting for some years to see whether any intermediate links might present, to claim for it specific rank. The ♀ I have not seen. I have in my collection two specimens of the one sex, all that I have seen.

ON THE STRUCTURE AND SYSTEMATIC POSITION
OF *CYSTOPELTA*.

By C. HEDLEY, F.L.S.

ASSISTANT IN ZOOLOGY, QUEENSLAND MUSEUM.

(Communicated by John Brazier, F.L.S.)

(Plate I.)

The privilege of investigating this interesting animal, I owe to the courtesy of Mr. Brazier, who allowed me to examine a couple of specimens collected by Mr. R. Helms in Wilson's Valley, on the flanks of Mt. Kosciusko, at an elevation of 5000 ft.

Nothing resembling it has, so far as I am aware, been recorded from Australia, but the mollusk at once recalled the description of *Cystopella petterdi*, Tate, (Trans. Roy. Soc. Tas. 1880, p. 17) to which externally it closely corresponds. Never having had an opportunity of examining the Tasmanian species, I shall assume that the N.S.W. animal is conspecific with *C. petterdi*, though the difference in colour, habitat, &c., would lead one to suppose that were a comparison instituted specific differences would be distinguished. To any Tasmanian naturalist who would assist me with specimens of *C. petterdi* for examination I should be most grateful.

The spirit specimen I have before me measures along the sole of the foot 15 mm., from the sole of the foot to the top of the visceral hump 7 mm., from the anterior to the posterior end of the mantle 12 mm., from the mouth to the pulmonary orifice 5 mm. The caudal mucous pore is small, not cleft to the sole, and from it a well-marked pedal line extends to the lips. The posterior half of the foot is free; of this the anterior portion is broadened into a saddle-like space upon which rests the visceral mass as in *Helicarion*.

The cap-like mantle, to which the generic name alludes, covering the whole of the visceral hump gives this odd creature somewhat the aspect of an *Onchidella*; on either side the margin adheres to the body, but before and behind the free edge descends like a curtain, from beneath which the tail alone protrudes; along each side runs an irregular black zig-zag stripe, while the ground colour is like the tail a dull brown; under a high power it is seen to be finely papillated and transversely wrinkled; except the sinus at the pulmonary orifice no lobes or cicatrices as of lobes coalesced together are apparent. I found no trace of a shell. In both specimens dissected the stomach was quite empty. Jaw arcuated, rather narrow, excessively thin and fragile; upper margin entire, concave edge divided into a dozen irregular teeth which show a tendency to split into minor denticules; no rostrum or central limb. The jaw exhibits no raised ribs or stout denticules after the *Helix* pattern, but rather appears as if an originally smooth jaw were irregularly crumpled and frayed. The teeth of the radula are extremely small, and seem from the unusual length of the basal plate to be arranged in distant rows; the rows are nearly straight; some 45 ranks from the rachidian they sweep up into a shallow curve and then flatten out again. I have some doubts whether I interpreted the rachidian aright; it appeared to be broadly reflected, cordate in outline, tapering to an acuminate point, with traces of lateral cusps. The laterals are remarkable for their long narrow basal plates, twice the length of their reflections, which are straight, slender and tapering. In the plane of the membrane the teeth are straight, but vertically they curve almost into a hook. A proximal accessory cusp appears a few removes from the rachidian, further away a distal cusp is also added; as the accessory cusps are unsymmetrical, and being in different planes cannot be focussed at once, they are somewhat difficult to observe. The genital system appears much contorted at its orifice, after which it divides into three portions; the duct of the genital bladder, which is rather short, twisted and continuing after reaching the genital bladder is again expanded into a second sac; the penis sac stout and pyriform, invaginated upon itself and

produced into a slender flagellum; and the vagina long and slender and also invaginated upon itself.

The features of this mollusk I am quite unable to reconcile with the systematic position assigned to it by Tryon in the "Manual of Conchology, Series Pulmonata," Vol. I., p. 227. To me it is clearly an aberrant form of *Helicarion*, and the following classification would better describe its affinities:—Family, *Zonitidae*; Subfamily, *Helicarioninae*; Genus, *Cystopelta*.

Col. Godwin-Austen describes how he traced from species to species in the Indian *Helicarioninae* a gradual diminution of the shell from the helicoid test of *Austenia* to the rudimentary shell of *Girasia*. The function of protecting the vital organs was gradually usurped by the mantle which became thicker and enlarged till the coalesced lobes exposed but a small portion of the shell. The advantage to the animal in ability to squeeze itself further and further into the crannies and crevices where it loves to hide is obvious, and the author speculates upon a further stage when the shell shall have entirely disappeared and the united mantle have entirely grown over it. This ideal form I believe we actually possess in *Cystopelta*, and in our Australian fauna we may say that as *Helicarion* is to *Parmacochlea*, so is the latter to *Cystopelta*.

No doubt *Aneitea* and *Limax* descended in a like manner from shell-bearing ancestors, who have only transmitted to them the little shapeless calcareous fragments concealed under the mantle to prove their genealogy. *Testacella* too, by similar reasoning, might claim some helicoid form like *Rhytida* for its origin in the dim past.

EXPLANATION OF PLATE.

Fig. 1.—Spirit specimen of *Cystopelta petterdi*, Tate (?) ($\times 4\frac{1}{2}$).

Fig. 2.—Rachidian, median and one lateral tooth of the odontophore of ditto (mag. 1000 diam.).

Fig. 3.—Jaw of ditto (much magnified).

Fig. 4.—Genital system of ditto (mag. 6 diam.).

NOTE ON THE STRUCTURE OF *ANNULARIA*
AUSTRALIS, FEISTMANTEL.

By R. ETHERIDGE, JUN., &c.

(PALÆONTOLOGIST TO THE AUSTRALIAN MUSEUM, AND GEOLOGICAL
SURVEY OF N. S. WALES).

(Plates II. & III.)

In his "Palaeozoische und Mesozoische Flora des östlichen-Australiens," * Dr. Ottokar Feistmantel described a species of the well-known Equisetaceous plant *Annularia*, as *A. australis*.† In this genus the stem is articulate, possessing solid diaphragms at the joints, the former giving support to pinnate or bipinnate branches. The leaves are verticillate, and more or less obliquely articulate on the branches, whilst those placed laterally, in regard to their position on the branch, are generally longer than the others. Each leaf is always more or less elongate, always lanceolate, and traversed by a median nerve.

The specimens figured by Feistmantel were very fragmentary, consisting of six isolated, or partially isolated, whorls of leaves, and are from the Lower Coal Measures at Greta, associated with *Glossopteris*. It must not be forgotten, however, that the late Rev. W. B. Clarke, in his paper "On the Occurrence and Geological Position of Oil-bearing Deposits in New South Wales,"‡ mentions that the cannel coal at Reedy Creek is "in places full of fronds of *Glossopteris*, and a plant branching after the manner of *Asterophyllites*, which lies in perfect unrumpled

* 4to Cassel, 1878-79.

† Pl. 25, f. 6 and 6a.

‡ Quart. Journ. Geol. Soc. 1866, xxii. p. 445.

order. . . . The shales are impressed with *Vertebraria*, *Glossopteris*, and *Gangamopteris*." As there is some resemblance between *Asterophyllites* and the plant now under consideration, it is not impossible that the latter may be here referred to.

The specimens now exhibited are from the ever-productive collection of Mr. John Waterhouse, M.A., Inspector of Schools, by whom they were obtained in the new tunnel at Anvil Creek, above the coal seam; and enable me to figure a much more complete specimen than that available to Prof. Feistmantel. The first of these consists of a piece of shale covered with the leaf whorls. From these can be selected two branches, three and four inches long respectively, bearing leaf whorls *in situ*. In the former there are four remaining, and in the latter six. The whorls or verticils are on an average three-quarters of an inch apart, and most of them are twelve-leaved, but one or two have as many as twenty-four leaves. The leaves are elongately lanceolate, and, so far as I can see, possess no other structure beyond the midrib. An average length is from a half to ten-sixteenths of an inch, and with moderately acute apices. In the form and arrangement of the whorls our plant approaches *A. stellata*, Schlotheim (= *A. longifolia*, Brong.), but the number of leaves to a verticil in the former is only about half the number seen in the latter species.

The second specimen consists only of the stems, one well-marked example being six and a half inches long. In this length the stem is twice bipinnate, the length between each articulation, and in consequence of an internode, being two inches or thereabouts. The length of the branches, so far as they are preserved, is three and a quarter inches. The stem in its present compressed form possesses a width of three-sixteenths of an inch, but at each articulation broadens out to seven-sixteenths, or nearly half an inch; both it and the branches are longitudinally striate, probably representing during life delicate ridges separated by flutings. At a few of the nodes or articulations are the remains of verticils of leaves.

A second and much enlarged edition of Prof. Feistmantel's work is about to appear in English, published by the Government Printer for the Geological Branch of the Department of Mines.* From this I take the liberty of extracting the following remarks of Dr. Feistmantel's in advance :—

After again describing the fragment of *Annularia australis* as only known to him, the author remarks that Prof. Schmalhausen has described † a genus of Coniferous plants from the Jurassic rocks of the Altai Mountains as *Cyclopitys*, and like *Annularia*, with the leaves arranged in whorls. Dr. Feistmantel adds: "In a subsequent paper of his, Prof. Schmalhausen has brought my *Annularia australis* into close relation with his genus *Cyclopitys*. I am, however, not quite certain about this correlation, especially as I cannot remember having observed in the Australian specimens a transverse striation to both sides of the midrib of the leaflets, which Prof. Schmalhausen points out as a characteristic of his genus." ‡

The matter, therefore, stands thus :—We have on the one hand a supposed Equisetaceous genus *Annularia*, in which the leaflets simply bear a midrib without any transverse striation ; and, on the other hand, a supposed Coniferous plant possessing similar leaves which are transversely striated. Both species described by Schmalhausen in the first of his quoted papers, viz., *Cyclopitys Nordenskiöldi*, Heer, sp., § and *C. Heeri*, Schm., || show the cross striation of the leaf very distinctly. These leaves seem

* Geological and Palæontological Relations of the Coal and Plant-bearing Beds of Palæozoic and Mesozoic Age in Eastern Australia and Tasmania, &c. *Mem. Geol. Survey N.S.W. No. 3 (in lit.)*.

† Jura-Flora des Bassins von Kusnezsk am Altai. (*Mém. Acad. Imp. Sc. St. Pétersbourg*, 1879, xxvii. No. 4.)

‡ Pflanzenpaläontologische Beiträge (*Bull. ibid.* 1883, xxviii. p. 426). [*teste Feistmantel*].

§ Jura-Flora des Bassins von Kusnezsk, &c. *Loc cit.* pp. 41 and 88, t. 1, f. 4b' ; t. 2, f. 1c. &c.

|| *Ibid.* p. 88, t. 14, f. 9-14.

to have a much more coriaceous texture, judging from the figures just quoted, than do those of *Annularia australis*. An attentive examination of the specimens now under description has quite failed to detect any transverse veining of the leaves. The entire absence of such a striation becomes more marked from the definite outline of the midrib.

It would appear therefore that the reference of this plant by Prof. Feistmantel to *Annularia* is strictly accurate, and that it does not correspond to the structure of *Cyclopitys* of Schmalhausen.

EXPLANATION OF PLATES.

PLATE II.

Fig. 1.—Foliage of *Annularia australis*, Feistmantel; nat. size.

Fig. 2.—Portion of a verticil enlarged to show the midrib of each leaflet, but without cross striation.

PLATE III.

Fig. 1.—Stem with articulations, internodes, branches, and traces of leaves; nat. size.

DESCRIPTION OF A NEW SNAKE FROM THE HERBERT RIVER DISTRICT.

BY J. DOUGLAS OGILBY, F.L.S.

It is to the kindness of Sir William Macleay that I am indebted for the pleasure of describing this new Water-Snake. The example described is in the collection of the Australian Museum, to which it was presented by Sir William, but I have also had the opportunity of examining two other specimens, forwarded at the same time, and now deposited in the Macleay Museum at the Sydney University; these three specimens were collected by Mr. J. A. Boyd of Ripple Creek, Herbert River, Queensland, and were originally exhibited as a new species of *Fordonia* at the Linnean Society's Meeting of March 27th, 1889.

PSEUDOFERANIA, *gen.nov.*

Differs from *Ferania* in having the scales in twenty-one rows, in having an extra shield on the head interposed between the posterior frontals, and in having two pre- and one post-oculars.

PSEUDOFERANIA MACLEAYI, *gen.et sp.nov.*

Scales in 21 series; abdominal plates 147; anal bifid; sub-caudal plates in two rows 38/38. Body stout, slightly compressed; head short, but little distinct from the neck; tail rather short, very much smaller and more strongly compressed than the body; muzzle short, broad, and truncate; eye small, situated on the upper angle of the head, the pupil vertical. Nostril on the upper surface of the head, in the centre of a large nasal, which is divided by a deep groove on its outer half, and forms a broad

suture with its fellow behind the rostral, which latter shield is twice as broad as high, and is rectangular posteriorly ; anterior frontals small, triangular ; posterior frontals much larger, separated the one from the other by an interposed shield, as large as one of the anterior frontals ; loreal large, twice the size of the same ; vertical pentagonal, acutely angular posteriorly, one-half longer than broad ; occipitals much longer than the vertical, more than twice as long as broad, and acutely rounded posteriorly ; one large supraciliary ; two pre- and one post-oculars ; temporals in three series, the first and third of the upper row being much larger than the others ; eight rather high and narrow upper labials, the fourth and fifth entering the eye, the eighth small. Lead color above, yellowish-white below, both colors sharply defined ; many of the scales of the back and sides blackish forming six irregular longitudinal bands ; a broad lateral lead-colored band on either margin of the abdominal plates, and a narrower and more obscure median one, not reaching to the vent ; a broad median black band on the sub-caudals.

DIPTERA OF AUSTRALIA.

BY FREDERICK A. A. SKUSE.

PART VIII.—THE TIPULIDÆ LONGIPALPI.

(Plates IV-VI.)

The TIPULIDÆ LONGIPALPI are distinguished from the BREVI-PALPI by several more or less prevailing characters. The insects themselves are usually large, and commonly keep the wings divaricate in repose. The terminal joint of the palpi is as a rule long and flagelliform. The antennæ are normally 13-jointed. The rostrum is generally prolonged and usually provided with a more or less distinct pointed nasus at the upper extremity. The ♂ genital organs are often very complicated. The wings are usually traversed by a distinct fold transversely across the apical portion; the venation, which is not subject to very much variation, is characterized by the auxiliary vein terminating in the first longitudinal vein; the absence of the sub-costal cross-vein; the first longitudinal vein ending in the second longitudinal, and connected, near its tip, to the costa by a cross-vein: this cross-vein together with the anterior branch of the second longitudinal form a small rhomboid cell (which seems characteristic of all the genera except some included in DOLICHOPEZINA); and lastly, the posterior intercalary vein originates so far back as to usually bring the discal cell in not more than punctiform contact with the fifth posterior cell.

About fifty species belonging to this division of the Tipulidæ are herein described, nearly two-thirds of the number being now characterized for the first time. The following is the summary and arrangement of the genera and species:—DOLICHOPEZINA,

genus *Dolichopeza*, Curtis (syn. *Apeilesis*, Macq.), 8, and *Tany-premna*, O.-Sack., 1; CTENOPHORINA, *Ctenogyna*, Macq., 1, and *Clytocosmus*, gen.nov., 1; TIPULINA, Sect. I. No nasus to rostrum, — *Ptilogyna*, Westw., 1; *Platyphasia*, gen.nov., 1; *Plusiomyia*, gen.nov., 5; *Habromastix*, gen.nov., 3; and *Phymatopsis*, gen.nov., 1: Sect. II. Nasus to rostrum, — *Semnotes*, Westw., 2; *Leptotarsus*, Guérin, 5; *Acracantha*, gen.nov., 3; *Ichnotoma*, gen.nov., 3; *Holorusia*, Loew, 2; (?) *Tipula*, Linn., 3; *Pachyrrhina*, Macq., 1; and *Macromastix*, O.-Sack., 6.

Apeilesis is considered identical with *Dolichopeza*, the difference to be found in the male holding-forceps not being regarded as of sufficient importance to split up the species into two genera, but possibly of some subordinate value. *Ctenogyna* has manifestly no relationship to *Ptilogyna*, inasmuch as it possesses a nasus and the general characteristics of the CTENOPHORINA. *Clytocosmus* (g.n.), also referred to this section, is a very striking form, apparently intermediate between the the CTENOPHORINA and TIPULINA. Among those genera provisionally included in TIPULINA, several interesting forms are described. *Ptilogyna ramicornis*, Walk., has been characterized under five different specific names by former authors. *Plusiomyia* (g.n.), is suggested for the reception of Walker's *Pedicia gracilis*, afterwards described by Westwood as *Ozodicera longipedalis*; and four new species are added, two doubtfully, for they exhibit certain peculiarities not quite in accordance with this genus. *Platyphasia* (g.n.) seems to be intermediate between *Ptilogyna* and *Plusiomyia*. The fresh genera *Habromastix* and *Phymatopsis* contain species which certainly seem related to those embraced in the three preceding, by the simple structure of the male genital organs, and in wanting a nasus to the rostrum, but exhibit some inconformities; the antennæ, which are very long in *Habromastix*, are in no case pectinate or even serrate. Among the species having a distinct nasus to the rostrum, none have been found to conform to the genus *Tipula* (*sensu stricto*); however, three old-described species are provisionally set down under that title until more complete information about them is forthcoming. Three species with serrate or sub-serrate antennæ

(including the insect described originally by Walker as *Ptilogyna par*) are included in *Ischnotoma* (g.n.). The examination of a very large number of specimens from all parts of Australia strongly convinces the author that only a single species of *Macromastix* has been hitherto recorded from this country; the original species, *M. costalis*, Swed., having been described under no less than six different names. Descriptions of five new species are now added; in one of these, the male possesses not nearly such long antennæ as *M. costalis*; the remaining four, while displaying all the leading characters of the genus, possess equally short antennæ in both sexes.

It will be noticed that the genera have been classified under the three sections suggested by Baron Osten-Sacken (Studies on Tipulidæ, I.), but this has been done in a most unsatisfactory manner, seeing that it is at present difficult to define the limits of any of them. Indeed in order to possibly discover well-defined sections among these insects, the student must first accumulate a mass of material from all parts of the world, and have access to the types of the previously described genera. It does not appear that we are justified in separating *Dolichopeza* and its relatives from the genera provisionally classified under TIPULINA, for the reason that it is uncertain whether forms like *Habromastix* and *Phymatopsis* are not exactly intermediate, and do not baffle all attempts to draw the line between the two. If we place them in a third group of DOLICHOPEZINA, the extent of that section will be so amplified that there appears no reason why other genera with simple genital organs in the ♂, abnormal antennæ, and with or without nasus to rostrum, should be excluded; and eventually we might find ourselves placing *Ptilogyna* and its allies in the same section. An exhaustive examination of the genital organs in *Ctenophora* and its relatives may discover characters which are distinctive; but *Clytocosmus*, which exhibits the general features of *Ctenophora*, is provided with a long glabrous rostrum, no nasus, and agrees with certain TIPULINA in the venation of the wings.

But though I cannot see how this suggested distribution into sections can stand, I am scarcely qualified to suggest a better division. There undoubtedly remain many interesting forms yet to be brought to light, which may materially alter our views.

It would be an unpardonable oversight if I did not here thankfully acknowledge the immense assistance gained from Baron Osten-Sacken's "Studies on Tipulidæ," also his kindness in sending me a copy of Westhoff's splendid paper "Ueber den Bau des Hypopygiums der Gattung *Tipula*," and several others of his own publication, otherwise not obtainable in the colonies; also Dr. Bergroth has rendered me considerable assistance by sending me copies of his valuable writings on Tipulidæ.

Section I. DOLICHOPEZINA.

This section, if it will eventually be admitted as such, at present may be said to include five described genera. They are, in the words of Osten-Sacken, "distinguished by the extreme length and slenderness of their legs (especially of the tarsi), and the light and delicate structure of their bodies: characters which, in the European *D. sylvicola*,* are connected with the habit of flying in zig-zag, *Ephmera*-like, in shady localities. . . . The antennæ of the male in this group are often much longer than those of the female; sometimes of extraordinary length. But that this character is, generically, an unimportant one, is proved by the genus *Megistocera*, where exceedingly long antennæ will occur in some species, and exceedingly short ones in others, without any noteworthy difference in the rest of the organisation." The author then goes on to say that he is unable to characterize this section as a whole; but "besides the great length and slenderness of the legs, the anterior branch of the second vein may be used for that purpose: it is either altogether absent (*Dolichopeza*) or obsolete, or else perpendicular, and not as usual oblique, thus rendering the rhomboid cell near the stigma more or less square."

* And apparently in all the other species; at any rate it applies to the Australian ones.

SYNOPSIS OF GENERA.*

I. Antennæ 13-jointed ; male forceps of a complex structure. No nasus to rostrum. No discal cell. Anterior branch of second longitudinal vein obsolete.

Præfurca very short ; great cross-vein before the proximal end of fourth posterior cell *Dolichopeza*, Curtis.

Præfurca wanting ; great cross-vein beyond the proximal end of fourth posterior cell..... *Scamboneura*, O.-Sack.

II. Antennæ less than 13-jointed ; male forceps small, of simple structure. Distinct nasus to rostrum. Discal cell present. Anterior branch of second longitudinal vein present.

a. Wings crystalline ; fifth posterior cell not in contact with the discal cell..... *Megistocera*, Wied.

b. Wings not crystalline ; fifth posterior cell in contact with the discal cell

Head on a neck-like prolongation of the thorax ; seventh longitudinal vein short, running into the anal angle..... *Brachypremna*, O.-Sack.

Head more closely applied to the thorax ; seventh longitudinal vein reaching the posterior border some distance from the anal angle..... *Tanypremna*, O.-Sack.

Genus 1. DOLICHOPEZA, Curtis.

Dolichopeza, Curtis, Brit. Entom. II. p. 62, 1825 ; Meigen, Syst. Besch. VI. p. 283, pl. 65, figs. 10-11, 1830 ; Macquart,

* Based on that by Baron Osten-Sacken (Studies I. p. 156, 1886).

S. & B. Dipt. I. p. 115, 1834; Zetterstedt, F. Lap. 1840; *Apsileta*, Macq., Dipt. Exot. suppl. I. p. 8, 1846; *Dolichopeza*, Walker, Ins. Brit. III. p. 315, 1856; O.-Sacken, Studies, I. p. 157, 1886; Bergroth, Wien. Ent. Zeit. VIII. p. 114, 1889.

Anterior branch of second longitudinal vein *entirely wanting*, consequently there is no rhomboid cell. Præfurca extremely short, often almost vertical. Discal cell *wanting*, the great cross-vein situated a considerable distance *before* the base of the fourth posterior cell. Antennæ 13-jointed. Genitalia of ♂ somewhat incrassate, sometimes with long digitiform appendages.

Rostrum short, without a nasus; the latter replaced by a tuft of hair. Front moderately broad; eyes nearly round. Second and third joints of palpi each longer than the first; fourth long, flagelliform. Antennæ 13-jointed, usually longer in ♂ than in ♀; first joint of scapus tolerably long, obconical; second small, cyathiform; flagellar joints cylindrical, gradually decreasing in length, more or less beset with stiff hairs; terminal joints very small. Collare somewhat prolonged. Thorax convex, elongate-ovate; transverse suture distinct; scutellum small; metanotum convex. Abdomen long, narrow, cylindrical; ♂ genital organs (Pl. VI., figs. 24, 25) somewhat incrassate, provided with long or short digitiform appendages; the lamella terminalis supera bidentate (with a deep emargination between) at the middle; ♀ ovipositor with rather short valves, the upper ones like the blade of a knife (spiniiform viewed from above) for about (or less than) the apical half. Legs very long and slender; tibiæ with very minute spurs, more distinctly visible on the hind pair; tarsi very slender, the metatarsal joint longer than the tibiæ.

The venation of the wings is not subject to much variation but is in some respects peculiar. The auxiliary vein ends just before the inner end of the stigma. The first longitudinal vein is incurved into the second before the middle of its length. The præfurca is remarkably short, usually scarcely longer than the small cross-vein; and the anterior branch of the second longitudinal vein is *entirely wanting*. Second posterior cell usually short, with a long petiole, but in *D.*

longifurca (similarly to the European *D. sylvicola*, Curtis, and the Algerian *D. fuscipes*, Berg.) it is long. The discal cell wanting, being opened posteriorly (into the fourth posterior cell), consequently the anterior branch of the fourth longitudinal vein appears as twice branched. The great cross-vein is situated much before its usual place, sometimes its length distant before the inner end of the fourth posterior cell (corresponding to the inner end of discal cell in most other genera). The anal angle is not very prominent in any of the species, but in some it is so reduced that the seventh longitudinal vein runs very close to the margin. The stigma, which is always distinct, is of a more or less oblong shape, and fills up the space between the costa and second longitudinal vein from opposite origin of præfurca to tip of first longitudinal; at each end of the stigma a more or less distinct white spot or light reflection seems always present.

I quite agree with Bergroth (Wien. Ent. Zeit. VIII. 1889, p. 114), that *Apeilesis* cannot be maintained as a genus distinct from *Dolichopeza*. The only difference pointed out by Osten-Sacken is the length of the digitiform appendages which are very conspicuous in *D. cinerea*, Macq., and some other species, while they appear to be very inconspicuous in the hitherto known examples of *Dolichopeza*; but I do not consider this character of more than sub-generic importance, even if it is that: at any rate it does not appear to be supported by any other peculiarities.

Only about half a dozen species of *Dolichopeza* appear to have been yet described; two or three from Europe (V. z.-b. G. Wien, XIX. pl. iv. 1869, figs. of wings by Mik), one from Algeria, another from Madagascar, and one from N. America. Eight are now characterized from Australia, seven of which are new. Doubtless numerous other species will be readily discovered.

All the following described species are found in damp shady situations. They may be at once recognized by their peculiar dancing flight; and on account of their extremely delicate and slender structure are extremely difficult to see when flying.

*Table for determining the species.*I. Genitalia of ♂ with short inconspicuous digitiform appendages: sub-gen. *Dolichopeza*.

Anal angle of wing only very slightly projecting, consequently the seventh longitudinal vein close to the margin.

1. Genua, tips of all the tibiae, and last four tarsal joints with tip of metatarsus, white *annulipes*, sp.n.
2. Genua, and last four tarsal joints with tip of metatarsus, white.
 - * Pleurae obliquely banded with brown..... *nivsitarsis*, sp.n.
 - ** Pleurae obliquely banded with white..... *monticola*, sp.n.

II. Genitalia of ♂ with long digitiform appendages: sub-gen. *Apeilexis*.

- a. Digitiform appendages smooth *planidigitalis*, sp.n.
- b. Digitiform appendages toothed on the inner side.
 1. Legs unicolorate.
 - † Second posterior cell short.
 - * Digitiform appendages bidentate at the middle *cinerea*, Macq.
 - ** Digitiform appendages with a tooth at the middle and another near the tip..... *brevifurca*, sp.n.
 - †† Second posterior cell very long..... *longifurca*, sp.n.
 2. Legs with the genua, tip of hind tarsi, and last four tarsal joints with tip of metatarsus, white *varipes*, sp.n.

I. ♂ *genitalia with short inconspicuous digitiform appendages.*386. *DOLICHOPEZA ANNULIPES*, sp.n.

♂.—Length of antennæ.....	0·070 inch	...	1·77 millimètres.
Expanse of wings.....	0·350 × 0·080	...	8·88 × 2·02
Size of body.....	0·290 × 0·030	...	7·35 × 0·76
♀.—Length of antennæ.....	0·070 inch	...	1·77 millimètres.
Expanse of wings.....	0·350 × 0·080	...	8·88 × 2·02
Size of body.....	0·320 × 0·030	...	8·12 × 0·76

Head, rostrum, and basal joints of palpi and antennæ pale yellow; occiput, suctorial labella, flagellar joints, and last joints of palpi brown; antennæ short, of equal length in both sexes; flagellar joints with two or three long stiff hairs near the base. Thorax brown, opaque, with a broad pale yellow stripe extending from the humeri, across the pleuræ, to base of hind coxæ; a small more or less distinct, V-shaped, yellow marking immediately below transverse suture; metanotum sometimes with a very distinct pale median line when viewed at a certain obliquity. Halteres with a dark brown club and yellowish-brown stem. Abdomen brown, the segments more or less distinctly banded with yellow across the middle, in the ♀ sometimes very indistinctly; genitalia ochreous-brown. Legs dark brown, ochreous towards base of femora, with yellow coxæ; genua, a broad ring at tip of tibiæ, tip of metatarsus and last four joints of tarsi entirely white. Wings anteriorly, and most of the veins, slightly clouded with pale brown; a distinct hyaline spot at each end of the stigma; stigma and veins brown, very distinct; anal angle of wing only a little projecting, consequently the seventh longitudinal vein close to the margin; great cross-vein rather more than half its length distant from inner end of fourth posterior cell.

Hab.—Lawson, Blue Mountains (Masters); Middle Harbour and Neutral Bay, near Sydney (Froggatt and Skuse). September to April. Eight specimens for comparison.

387. *DOLICHOPEZA NIVEITARSIS*, sp.n.

♂.—Length of antennæ.....	0.125 inch	...	3.16 millimètres
Expanses of wings.....	0.330 × 0.080	...	8.38 × 2.02
Size of body.... .	0.260 × 0.030	...	6.62 × 0.76
♀.—Length of antennæ.....	0.075 inch	...	1.89 millimètres.
Expanses of wings.....	0.350 × 0.080	...	8.88 × 2.02
Size of body.....	0.310 × 0.030	...	7.87 × 0.76

Head, rostrum and basal joints of antennæ yellow or brownish-ochreous; occiput, flagellar joints, suctorial labella and palpi brown; ♂ antennæ considerably longer than those of ♀, the flagellar joints in both sexes beset with short stiff hairs. Thorax brown, opaque, slightly ochreous in front of humeri; pleuræ ochreous or brownish-ochreous, with a broad brown band from humeri to pectus (between fore and intermediate coxæ). Halteres brown. Abdomen dark green or brown,* the segments more or less distinctly banded across the middle with lighter colour; genitalia ochreous-brown. Legs dark brown, ochreous towards base of femora, with yellow coxæ; genua slightly, and tip of metatarsus and last four joints of tarsi entirely, white. Wings almost hyaline, very slightly clouded with pale brownish on the cross-veins and round the apical margin; a whitish spot at each end of the stigma; stigma and veins brown, very distinct; anal angle of wing only slightly projecting, consequently the seventh longitudinal vein very close to the margin; great cross-vein rather more than half its length distant from inner end of fourth posterior cell.

Hab.—Lawson, Blue Mountains (Masters); North Shore and Mossman's Bay, near Sydney (Skuse). September to January. Nine specimens.

* I do not remember what the colour was in freshly caught specimens, but it was probably always green.

388. *DOLICHOPEZA MONTICOLA*, sp.n.

♂.—Length of antennæ..... 0·085 inch ... 2·14 millimètres.
 Expanse of wings..... 0·300 × 0·065 ... 7·62 × 1·66
 Size of body..... 0·260 × 0·030 ... 6·62 × 0·76

♀.—Length of antennæ..... 0·065 inch ... 1·66 millimètres.
 Expanse of wings..... 0·360 × 0·080 ... 9·13 × 2·02
 Size of body..... 0·340 × 0·030 ... 8·62 × 0·76

Head, rostrum, basal joints of antennæ, and (generally) first two joints of palpi yellow; occiput, suctorial labella, terminal joints of palpi, and flagellar joints of antennæ dark brown; antennæ short, a little longer in ♂ than in ♀, the flagellar joints with two or three long stiff hairs near the base. Thorax brown, opaque, with a broad whitish or pale yellow stripe from humeri, across pleuræ, to base of hind coxæ; pronotum sometimes pale yellow; often indistinct traces of two pale brown lines terminating at suture; the latter, a spot above origin of wings, and the scutellum and metanotum similarly pale. Halteres dark brown, pale at the base of stem. Abdomen dark brown (? green in fresh specimens), the segments with an ochreous or pale greenish lateral spot at the middle of their length; genitalia (Pl. vi., fig. 24) more or less tinged with ochreous. Legs dark brown, coxæ and base of femora ochreous, the fore and intermediate coxæ with a brown spot at the base; genua slightly, and tip of metatarsus with following four joints entirely, white. Wings sub-hyaline, the veins and apex slightly clouded with pale brownish; a whitish spot at each end of stigma; stigma and veins brown, very distinct; anal angle of wing only a little projecting, consequently the seventh longitudinal vein close to the margin; great cross-vein usually less than its length distant from inner end of fourth posterior cell.

Hab.—Mount Kembla, Illawarra district (Skuse). November. Five specimens.

II. ♂ forceps with long digitiform appendages.

389. DOLICHOPEZA CINEREA, Macquart.

Apeilesis cinerea, Macq., Dipt. Exot. Suppl. I. p. 8, pl. 1, fig. 3, 1846; O.-Sacken, Studies, I. p. 151, 1886.

♂.—Length of antennæ.....	0.135 inch	...	3.42 millimètres.
Expanse of wings.....	0.420 × 0.095	...	10.66 × 2.39
Size of body.....	0.330 × 0.035	...	8.38 × 0.88
♀.—Length of antennæ.....	0.090 inch	...	2.27 millimètres.
Expanse of wings.....	0.420 × 0.095	...	10.66 × 2.39
Size of body.....	0.330 × 0.035	...	8.38 × 0.88

Greyish-ochreous. Occiput, palpi and flagellar joints often darker greyish; antennæ in ♂ considerably longer than in ♀, the flagellar joints with a few short stiff hairs near the base. Thorax opaque, often with three broad greyish or light brownish stripes. Halteres with a slightly infuscated club. Abdomen with the terminal segments sometimes tinged with brown, or bordered with brown posteriorly; ♂ genitalia concolorous with rest of body; lamella terminalis supra bidentate in the middle, with a deep emargination between; digitiform appendages long, bidentate on the inner side towards the middle; ♀ ovipositor brownish-ochreous, shining. Legs uniformly greyish. Wings with a light greyish appearance; an indistinct paler reflection at each end of stigma; stigma and veins grey; anal angle of wing distinct; great cross-vein not its length distant from inner end of fourth posterior cell.

Hab.—Tasmania (Verreaux); generally distributed in N.S.W. (Masters and Skuse). September to February. About sixty examples.

Obs.—The above-described seems to best correspond with Macquart's very brief description, and is the commonest of our species.

390. *DOLICHOPEZA PLANIDIGITALIS*, sp.n.

♂.—Length of antennæ.....	0·150 inch	...	3·81 millimètres.
Expansé of wings.....	0·380 × 0·80	...	9·64 × 2·02
Size of body	0·300 × 0·035	...	7·62 × 0·88

Head greyish ; front, rostrum, and basal joints of antennæ ochreous-yellow ; flagellar joints, suctorial labella, and palpi brown or greyish-brown ; antennæ the length of head and thorax taken together, the flagellar with some short stiff hairs near the base. Thorax greyish-brown with some ochreous, opaque, with three indistinctly darker stripes above, the intermediate stripe the most distinct, cuneiform. Halteres infuscated, the base of the stem yellow. Abdomen ochreous, the segments infuscated with brown anteriorly and posteriorly, the last one or two segments and genitalia usually brown ; lamella terminalis supera bidentate in the middle with a deep emargination between ; digitiform appendages long, smooth (Pl. vi. fig. 25). Legs uniformly ochreous-grey. Wings with a light greyish appearance ; an indistinct paler reflection at each end of stigma ; stigma and veins brown ; anal angle of wing distinct ; great cross-vein not its length distant from inner end of fourth posterior cell.

Hab.—Wheeny Creek, Hawkesbury district, N.S.W. (Skuse). Four specimens in January.

Obs.—Easily distinguished from *D. cinerea*, Macq., by the distinctly brown-ringed abdomen, darker thorax, and smooth digitiform appendages of the ♂ genitalia.

391. *DOLICHOPEZA LONGIFURCA*, sp.n. (Pl. iv. fig. 1).

♀.—Length of antennæ.....	0·110 inch	...	2·79 millimètres,
Expansé of wings.....	0·450 × 0·115	...	11·43 × 2·92
Size of body.....	0·430 × 0·045	...	10·92 × 1·13

Brown. Front, rostrum, and joints of scapus ochreous ; flagellar joints irregularly beset with short stiff hairs. Thorax

lighter brown than head and abdomen, with very indistinct traces of stripes. Halteres infuscated, the base of stem yellow or ochreous. Valves of ovipositor ochreous towards the tip. Legs greyish-brown, the genua slightly ochreous. Wings almost hyaline, with a very pale brownish tint, more distinct in costal cells and about the veins; an indistinct whitish reflection at each end of stigma; stigma and veins brown, distinct; second posterior cell long and narrow, with a short petiole; anal angle of wing distinct; great cross-vein half its length distant from inner end of fourth posterior cell.

Hab.—Sydney (Masters and Skuse). Three specimens.

Obs.—Easily distinguished from the next, *D. brevifurca*, which it most resembles, by the length and narrowness of the second posterior cell and situation of the great cross-vein.

392. DOLICHOPEZA BREVIFURCA, sp.n.

♂.—Length of antennæ..... 0·150 inch ... 3·81 millimètres.
 Expanse of wings..... 0·410 × 0·100 ... 10·41 × 2·54
 Size of body..... 0·380 × 0·040 ... 9·64 × 1·01

♀.—Length of antennæ..... 0·100 inch ... 2·54 millimètres.
 Expanse of wings..... 0·470 × 0·115 ... 11·93 × 2·92
 Size of body..... 0·450 × 0·045 ... 11·43 × 1·13

Brown. Face, rostrum and joints of scapus sometimes ochreous or brownish-ochreous; ♂ antennæ considerably longer than those of ♀, the flagellar joints in both sexes beset near the base with short stiff hairs. Thorax with three darker brown broad stripes; the lateral ones interrupted at the suture but continued beyond, intermediate one cuneiform. Halteres infuscated, ochreous at base. Abdomen ochreous, with five or six broad rings of black or dark brown; first ring at middle of second segment, the remainder covering the incisions; ♂ genitalia with the lamella terminalis supra bidentate with a deep emargination between; digitiform appendages long, bidentate on the inside, the first tooth about the

middle and second near the tip. Legs uniformly brown. Wings almost hyaline, with an indistinct greyish or brownish tint, particularly in neighbourhood of the veins; a whitish spot at each end of stigma; stigma and veins brown, distinct; second posterior cell broad, shorter than or equal in length to distance between its inner end and small cross-vein; anal angle of wing distinct; great cross-vein its length distant from inner end of fourth posterior cell.

Hab.—Wagga Wagga (Skuse); Jindabyne, 3000 ft., and Moonbar, 3500 ft., Mount Kosciusko, N.S.W. (Helms), *four specimens in Coll. Aust. Museum.*

Obs.—I took three specimens at Wagga Wagga in the month of October; Mr. Helms captured the Kosciusko specimens in March.

393. *DOLICHOPEZA VARIPES*, sp.n. (Pl. iv. fig. 2).

♂.—Length of antennæ.....	0·110 inch	...	2·79 millimètres.
Expanse of wings.....	0·350 × 0·070	...	8·88 × 1·77
Size of body.....	0·310 × 0·030	..	7·87 × 0·76
♀.—Length of antennæ.....	0·075 inch	...	1·89 millimètres.
Expanse of wings.....	0·350 × 0·070	...	8·88 × 1·77
Size of body.....	0·330 × 0·030	...	8·38 × 0·76

Head and thorax greyish or brownish-ochreous; rostrum and joints of scapus usually ochreous; suctorial labella, palpi and flagellar joints brown; ♂ antennæ considerably longer than those of ♀; the flagellar joints with two or three short stiff hairs near the base. Thorax usually with more or less distinct traces of three rather narrow brown stripes (sometimes very distinct), the intermediate ones interrupted at, but continued beyond, the suture. Halteres with black club. Abdomen ochreous, broadly ringed with dark brown: the rings, which cover the anterior two-thirds of each segment, also extend over the posterior border of the preceding segment; second segment more or less distinctly ringed across the middle; ♂ genitalia with the lamella terminalis supra bidentate with a deep emargination between; digitiform appendages

long, bidentate on the inside at the tip. Legs brown, with coxæ and basal portion of femora ochreous; genua slightly white; hind tibiæ (only) with a broad ring of white at the tip; tip of metatarsus and following four tarsal joints white. Wings perfectly hyaline, with a very faint indication of a spot of light reflection at each end of stigma; veins and stigma brown, distinct; anal angle very slight; seventh longitudinal vein short, close to the margin; great cross-vein its length distant from inner end of fourth posterior cell.

Hab.—Almost everywhere in N.S.W. (Masters and Skuse). September to January. About forty specimens before me.

Obs.—The hind tibiæ only are tipped with white, which at once distinguishes this species.

Genus 2. TANYPREMNA, O.-Sacken.

Tanypremna, O.-Sack., Biol. Cent. Amer. Dipt. p. 19, pl. 2, fig. 2, 1886; Studies I. p. 163.

"Very closely allied to *Brachypremna*; the differences are: the prothorax has no neck-like prolongation, the head is closely applied to it; the seventh vein does not run into the anal angle close alongside the margin of the wing, but has the ordinary oblique position; the præfurca is shorter, more straight in its course, more oblique in its position; the remaining section of the second vein less sinuate; the abdomen is comparatively longer; the metanotum less horizontal, more sloping" (Osten-Sacken).

Rostrum short, pubescent; nasus very distinct, with a few hairs at the tip. Front narrow; eyes prominent. Palpi long; second and third joints about equal in length, the former broader towards the apex; first joint shorter; fourth joint very long, longer than the preceding three taken together. Antennæ short, beset with very short hairs (! always), 12-jointed;* first joint of the scapus

* Baron Osten-Sacken counted eleven joints in *T. opilio*, O.-Sack., but in *T. manicata*, O.-Sack., there are more (possibly only twelve).

elongate, second short, almost globose; first few flagellar joints elliptic or ovate, progressively shortening and narrowing, the last few joints (the terminal four in *T. fastidiosa*) linear (Pl. vi., fig. 27, ♂ antennæ of *T. fastidiosa*). Collare inconspicuous. Thorax elongate-ovate; scutellum small; metanotum convex. Abdomen rather slender, at least twice the length of the thorax; ♂ forceps not incrassate, of simple structure (Pl. vi., fig. 26, forceps of *T. fastidiosa*); ♀ ovipositor with rather small straight pointed valves. Legs very long and slender; all tibiæ with a pair of small spurs; tarsi twice the length of tibiæ, the metatarsal joint very long. Wings longer than the abdomen. Discal cell present.

According to the generic description of *Brachypremna*, which I understand to agree in the main with this genus (of which I have not seen the original diagnosis), one of the most striking features is the perpendicular position of the anterior branch of the second longitudinal vein, which is inserted at the point where the first vein incurves into the second, and looks like a cross-vein; in *T. fastidiosa*, however, this branch is obliquely situated.

394. TANYPREMNA FASTIDIOSA, sp.n. (Pl. iv., fig. 3).

♂.—Length of antennæ.....	0·070 inch	...	1·77 millimètres.
Expansé of wings.....	0·600 × 0·130	...	15·24 × 3·30
Size of body.....	0·410 × 0·070	...	10·41 × 1·77
♀.—Length of antennæ.....	0·070 inch	...	1·77 millimètres.
Expansé of wings.....	0·670 × 0·150	...	17·01 × 3·81
Size of body.....	0·500 × 0·075	...	12·70 × 1·89

Greyish-ochreous. Palpi and antennæ (except first joint of the scapus) brown. Thorax with four pale brown (sometimes very indistinct) narrow stripes extending to suture; intermediate stripes confluent posteriorly; lateral ones short, rather broader and less distinct than the intermediate; hind portion of thorax to metanotum pale brown, with a more or less distinct median line from suture, usually very indistinct on metanotum; pleuræ and coxæ

somewhat hoary. Halteres with a brown stem. Abdomen more or less tinged with brown or brownish, usually on the terminal segments; genitalia ochreous. Legs long and very slender. Wings with pale greyish cloudings, the clear spaces appearing whitish when viewed at a certain obliquity; two very noticeable whitish spaces occur on the posterior margin, the first, usually squarish, at tip of seventh longitudinal vein, the second triangular, beneath tip of sixth longitudinal; most of the cells at apex of wing with a central clear space, it really being the veins which are clouded. Anterior branch of second longitudinal obliquely situated, the first longitudinal terminating in it close to the base; ultimate section of second longitudinal vein a little arcuate, bending anteriorly towards the tip; præfurca short, slightly arcuated at its origin, in line with remaining portion of second longitudinal; discal cell longer than wide, pentagonal, in punctiform contact with the fifth posterior.

Hab.—Lawson, Blue Mnt., and Berowra, N.S.W. (Masters); Middle Harbour, near Sydney (Skuse). Five specimens.

Section II. CTENOPHORINA.

First longitudinal vein usually terminating in the anterior branch of the second longitudinal in such a manner that the ultimate section of the branch appears as a continuation of the first longitudinal. Normal number of antennal joints thirteen in both sexes; in ♂ the flagellar joints with a variable number of branches, or rarely (in *Prionota*) only serrate; in the ♀ simple, serrate, or rarely with short branches. Head closely applied to the thorax; front broad; eyes round. Rostrum as short as, or shorter than in *Pachyrrhina*, gibbose in front; nasus present, obtuse, hairy. Legs short and stout; tarsi usually shorter than the tibiae; metatarsal joint shorter than, equal in length to, or but little longer than the remaining four joints taken together; unguis large. Genitalia of ♂ of a complicated structure, sometimes (in *Ctenophora*) with a long protruding adminiculum.

This section awaits definition. The above enumerated characters derived from Baron Osten-Sacken's comparative survey of this section and the TIPULINA, will be found to distinguish the majority of the genera. But the genus now described under the name *Clytocosmus*, though exhibiting all the striking features of the section, differs in possessing a long, straight, glabrous rostrum, destitute of a nasus, and agrees with the TIPULINA in the position of the anterior branch of the second longitudinal vein.

Baron Osten-Sacken omitted Macquart's *Ctenogyna* in his synopsis of the described *Ctenophoræ* (Studies I., p. 166), and with the assistance of only incomplete information about the insect evidently seemed inclined (l.c. p. 177-178) to regard it as a near relative of *Psilogyna*. Macquart's figure of the head is misleading, as it does not show the nasus.

SYNOPSIS OF GENERA.

I. *Antennæ branched in ♂ only.*

♂ antennæ with alternate long and short branches; the long ones not much longer than the short; ♀ antennæ not much longer than the head. *Dictenidia*, Brullé.

♀ antennæ as long as the thorax; joints cylindrical, decreasing in length from the third to twelfth; third very long. *Xiphura*, Brullé.

Antennæ longer than the head; ♂ antennæ with alternate long and short branches, the long ones sometimes much longer than the short; twelfth joint with only one pair of branches. Adminiculum conspicuous. *Ctenophora*, Meig.

♂ antennæ with four equally long branches on the same joint; the twelfth joint with two pairs of branches. Adminiculum wanting. *Pselliophora*, O.-Sack.

II. *Antennæ not branched in either sex.*

Antennæ considerably longer than the head, serrate; third and following joints slender at the base and enlarged into a broad knob towards the underside. *Prionota*, v. d. Wulp.

III. *Antennae with a certain number of branched joints in both sexes.*

♀ antennae with the second to eighth flagellar joints with a pair of short branches (♂ unknown). *Otenogyna*, Macq.

♂ antennae with first nine, ♀ with first eight, flagellar joints with a pair of short branches, shorter in ♀ than in ♂; the terminal joints filiform, densely beset with almost erect hairs. *Clytocosmus*, Sk.

Genus 3. *OTENOGYNA*, Macquart.

Otenogyna, Macq., Dipt. Exot. I. p. 42, 1838; O.-Sacken, Studies I. p. 177, 1886.

First longitudinal vein terminating in anterior branch of second longitudinal in such a way that the latter appears as a continuation of the first. Rostrum very short, porrect, with an obtuse, hairy nasus. Antennae 13-jointed; in ♀ the first flagellar joint with a short tooth-like branch beneath, the next seven joints provided with two short, somewhat fusiform, branches laterally at the base; the three terminal joints small, simple, ovate.

Head closely applied to the thorax; front tolerably broad, convex, clothed with short hairs. Rostrum about half the length of the head, pubescent, with a distinct, obtuse, hairy nasus. Eyes almost ovate, prominent. Palpi short; first and third joints shortest, cylindrical, about equal in length; second joint robust, thicker at apex, about one-third longer than the first or third; fourth slender, scarcely as long as the next preceding two taken together. Antennae 13-jointed, beset with very short hairs; first joint of the scapus long, obconical, second joint cyathiform; the first flagellar joint with a short tooth-like branch beneath, the next seven joints cylindrical or subcylindrical, provided with two lateral, somewhat fusiform, branches at the base, about one-third longer than the joints; terminal three joints small, simple, ovate. Collare inconspicuous, compressed. Thorax convex, elongate-ovate; transverse suture distinct; scutellum small; metanotum convex. Abdomen more than twice the length and

about the width of the thorax; first segment short, half the width of the third; second truncate-conical; fourth and fifth widest, short; sixth and seventh narrowing; ovipositor with two straight, slender, pointed upper valves, the lower ones also straight, but thicker, about $\frac{2}{3}$ the length of the upper. Legs tolerably short and stout, densely clothed with short semi-erect hairs; tibiæ about equal in length to the femora, armed with a pair of spurs; tarsi rather shorter than tibiæ, the metatarsal joint rather shorter than the remaining four joints taken together; ungues large, smooth. Wings about length of the entire insect, broad, with a distinct anal angle. First longitudinal vein terminating in anterior branch of second near the base in such a manner that the remaining portion of the branch appears as a continuation of the first. Second posterior cell petiolate. Fifth posterior cell longer than wide, nearly or quite in punctiform contact with the discal cell.

Macquart was mistaken when he asserted that the antennæ are 14-jointed, he evidently counted the tenth joint as two; also, the first flagellar joint is not provided with a pair of branches, but is produced beneath.

395. CTENOGYNA BICOLOR, Macquart. (Pl. iv., fig. 4.)

C. bicolor, Macq., Dipt. Exot. I. p. 43, pl. 2, figs. 2 and 2a., 1838.

♀.—Length of antennæ.....	0·120 inch	...	3·04 millimetres.
Expanses of wings.....	0·540 × 0·160	...	13·70 × 4·06
Size of body.....	0·540 × 0·090	...	13·70 × 2·27

Head brown, or black, pubescent; face, genæ, rostrum and palpi brownish-fulvous, the nasus and last two joints of palpi sometimes brown; antennæ black or blackish-brown, the two joints of the scapus fulvous or brownish-fulvous; first flagellar joint with a single short branch beneath; the second to eighth cylindrical, with a short branch on each side at the base; remaining three terminal joints ovate. Collare fulvous. Thorax fulvous to

brownish-fulvous, dull, traversed by two rows of yellowish hairs. Halteres brown (fulvous in old specimens). Abdomen dull black or brown, with the first one or two segments, the venter, and ovipositor fulvous or brownish-fulvous. Legs fulvous, with the tip of femora, apical half of tibiae, and entire tarsi, black. Wings blackish (much paler in old specimens), the costal cells and stigma darker than the rest; veins black. Auxiliary vein running close to first longitudinal vein, joining it about opposite inner end of second sub-marginal cell; first longitudinal terminating in anterior branch of second longitudinal vein near the base; petiole of first sub-marginal cell sometimes as much as twice the length of the anterior branch; petiole of second posterior cell short (in one specimen extremely short); discal cell usually squarish, longer than broad, almost or quite in punctiform contact with fifth posterior.

Hab.—Upper Hunter, N.S.W., and Gayndah, Q. (Masters); Mount Kembla, Illawarra District (Skuse). November. Four specimens.

Obs.—Macquart did not know to what country this insect belonged, but conjectured that it was probably Australia.

Genus 4. CLYTROCOSMUS, gen. nov.

Anterior branch of second longitudinal vein originating from that vein a little beyond the termination of the first longitudinal vein and not appearing as the continuation of it. Rostrum long, directed downwards, without a nasus. Antennae 13-jointed; in ♂ first nine, in ♀ first eight, flagellar joints provided with two short branches, which are much shorter in the ♀ than in the ♂; the terminal joints irregularly beset with almost erect hairs. ♂ genital organs probably of complicated structure, withdrawn into the anal segment; ♀ ovipositor with long, straight, valves.

Head closely applied to the thorax; front broad, flattened, at a right angle with the plane of face and rostrum, with a sparse, scarcely noticeable pubescence (Pl. iv., fig. 5c). Rostrum longer than the head, glabrous; nasus wanting. Eyes round, rather prominent. Palpi short; first three joints of almost equal length, the third rather

thicker and shorter than the others ; fourth joint shorter than the preceding three taken together. Antennæ 13-jointed in both sexes ; first joint of the scapus long, obconical, second short, cyathiform ; in ♂ (Pl. iv., fig. 5a) the first nine flagellar joints short, subcylindrical, with a few inconspicuous hairs on the upper side, and a pair of short tolerably stout branches, the latter about $\frac{1}{3}$ longer than the joints ; tenth joint filiform, four times the length of last, rather thickly and distinctly beset with almost erect hairs ; terminal joint short, similarly haired to the last ; in ♀ (Pl. iv., fig. 5d) the first eight flagellar joints with a pair of very short branches, about equal in length to the joints ; ninth joint rather longer than eighth, subfusiform ; tenth filiform, gradually growing clavate at apex, twice the length of the last ; terminal joint minute ; the terminal simple joints beset with hairs as in ♂. Collare inconspicuous, compressed. Thorax large, convex, elongate-ovate ; transverse suture distinct ; pleuræ with a small, distinct, pointed tubercle before the origin of the wings ; also metathorax with a rather more prominent similar protuberance immediately above the origin of the halteres ; scutellum small ; metanotum convex. Abdomen twice the length of thorax, wide, thick, somewhat depressed ; first segment short, scarcely half the width of the third ; second truncate-conical ; third and fourth the widest, rather more than half the length of the second ; fifth to seventh short, gradually narrowing in width ; ♂ genital organs probably of complicated structure, withdrawn into the anal segment, with no protruding adminiculum ; ♀ ovipositor with the upper valves long, straight, very slender and pointed, the lower ones about two-thirds the length of the upper, straight, moderately thick, pointed. Legs comparatively short and stout, glabrous to the naked eye, but densely clothed with minute pubescence ; tibiæ shorter than the femora, especially the fore and intermediate pairs, the two hind pairs armed with a pair of spurs, the fore pair with only one ; tarsi shorter than the tibiæ, the metatarsal joint rather shorter than the remaining four joints taken together ; ungues strong. Wings in ♂ rather longer, in ♀ rather shorter than the abdomen, broad, with a distinct anal angle. First longitudinal vein ter-

minating in second a little before the origin of the anterior branch, consequently the latter not appearing as a continuation of the former. Second posterior cell petiolate. Fifth posterior cell large, its length and width about equal, in punctiform contact with the discal.

The remarkably fine insect, for which I am compelled to institute this new genus, is evidently intermediate between the *Ctenophora* and those *TIPULINA* possessing branched antennae and wanting the nasus to rostrum, and seems to render a satisfactory division of the genera into groups hopeless. The robust glabrous body, striking colours, 13-jointed branched antennae, stout legs, short tarsi, etc., at once stamp the insect as one of the *CTENOPHORINA*, whilst the long glabrous rostrum, perfectly destitute of a nasus, and the position of the anterior branch of the second longitudinal vein remind one of *Ptilogyna*, *Plusiomyia* and their relatives, though the structure of the head and direction of the rostrum quite differ. In short, *Clytocosmus* is more of a *Ctenophora* than a *Tipula*, but the question is, should it occupy an isolated position?

Having only one specimen of the ♂, and the genitalia being in a dried retracted state, I am compelled to postpone an examination of these organs.

396. *CLYTOCOSMUS HELMSI*, sp.n. (Pl. iv., fig. 5.)

♂.—Length of antennae..... 0·250 inch ... 6·34 millimètres.
 Expanse of wings..... 0·760 × 0·220 ... 19·32 × 5·58
 Size of body 0·730 × 0·240 ... 18·54 × 6·09

♀.—Length of antennae..... 0·180 inch ... 4·56 millimètres.
 Expanse of wings..... 0·850 × 0·250 ... 21·58 × 6·34
 Size of body..... 1·060 × 0·240 ... 26·94 × 6·09

Opaque. Entire head, rostrum and first joint of antennae reddish-fulvous; suctorial labella, palpi, and remainder of antennae black; ♂ antennae with the first 9 flagellar joints having a moderately long branch on each side about the middle, progressively decreasing in length, the tenth joint filiform and with the short terminal joint beset with hairs; ♀ with the first 8 flagellar joints

having a short, tooth-like branch on each side ; ninth joint almost fusiform, tenth filiform growing gradually thicker towards the apex, both beset with hairs ; terminal joint very small. Prothorax black. Thorax reddish-fulvous above, the anterior margin bordered with a hoary white line, applied to which is a more or less well-defined black spot, extending backwards sometimes as far as half way to the transverse suture, traversed along the middle by a more or less distinct white line which issues from the line along the anterior margin ; the mesothorax more or less distinctly bordered laterally and posteriorly with a hoary white line ; humeral pits black ; pleuræ velvety black, mottled with several brown and white spots ; transverse suture black at the middle, forming a triangular spot, from the posterior angle of which a dark line extends backwards to the scutellum ; scutellum velvety black, with two sub-triangular hoary white spots ; metanotum velvety black. Halteres black. Abdomen velvety black ; first segment slightly bordered with whitish or greyish anteriorly, with a round white spot on the sides ; second marked near the hindmargin, from each side, with a white transverse stripe ; third, fourth and fifth with four more or less equidistant white spots, the two intermediate spots on the fifth segment larger, oblong, sometimes confluent with the lateral spots ; sixth segment with a white spot on each side ; anal segment and genitalia entirely reddish-fulvous in both sexes ; venter more or less tinged with obscure reddish-fulvous and sometimes with a beautiful yellowish-white bloom when viewed at a certain obliquity. Legs black ; the coxæ marked with a large hoary white spot. Wings with a pale fulvous tint, more distinctly anteriorly ; veins fulvous ; stigma indistinct.

Hab.—Moonbar, Mount Kosciusko, 3-3500 ft., N.S.W. (Helms). Three specimens in *Coll. Australian Museum*. March.

Obs.—This magnificent insect is dedicated to its discoverer Mr. R. Helms.

Section III. TIPULINA.

This section is as difficult to define as the DOLICHPOEZINA and CTENOPHORINA, and possibly will ultimately be subdivided.

Were it not for the existence of some Australian and South American forms the remaining genera, as far as they are known, might be considered to form a tolerably compact section.

The insects here included may usually be distinguished from *DOLICHOPEZINA* by the possession of 13- (or more) jointed antennæ, a discal cell, posterior cell in contact with the discal, moderately long præfurca, oblique position of the anterior branch of the second longitudinal vein, and character of the male genital organs; while, on the other hand, they may be distinguished from the *CRENOPHORINA* by their slender form, long slender legs, &c.; but until our knowledge of the Tipulidæ-longipalpi is more extended, a satisfactory division into sections seems impossible, though likely enough increased acquaintance with known genera and the discovery of new forms may render the task still more impracticable.

SYNOPSIS OF GENERA.

I. NO DISTINCT NASUS TO ROSTRUM; ♂ FORCEPS OF SIMPLE STRUCTURE.

A. Antennæ pectinate, with a variable number of joints.

1. Antennæ 13-jointed in ♂, 15-jointed in ♀.

a. ♂ antennæ with long branches.

* *Second submarginal and discal cells in complete contact.*

♂ antennæ: first flagellar joint short, with a long branch on the underside; second to eighth with three long branches, one on each side at the base and the other beneath at the middle; on the eighth joint (which is much prolonged) the third branch short and situated near the apex; three cylindrical terminal joints. ♀ antennæ: first flagellar joint short, with a short branch beneath; second to eighth with a short branch on each side at the base, those on the outside rather longer, especially the middle ones; five cylindrical terminal joints. *Ptilogyna*, Westw.

**** Second submarginal and discal cells not in contact, separated by small cross-vein.**

♂ antennæ: first flagellar joint short, without a branch; second to eighth with a single long branch on the outer side; eighth joint not much longer than the preceding ones; three cylindrical terminal joints.

Platyphasia, Sk.

b. ♂ antennæ with short branches.

Div. 1. ♂ and ♀ antennæ: first flagellar joint tolerably long, thickened at apex, or even with a short branch beneath; second to seventh with a short branch on each side at the base; in ♂ with four, in ♀ with six long cylindrical terminal joints.

Div. 2. ♀ antennæ: first flagellar joint short, with a short branch beneath; second to seventh or ninth with a short branch on each side at the base; four or six short cylindrical terminal joints. *Plusiomyia*, Sk.

B. Antennæ simple.

I. *Antennæ 11-jointed in ♂, 13-jointed in ♀.*

♂ antennæ about length of entire body, densely beset with short erect hairs; ♀ antennæ about length of thorax.

Habromastix, Sk.

2. *Antennæ 13-jointed (? in both sexes).*

Antennæ short.

Phymatopsis, Sk.

II. DISTINCT NASUS TO ROSTRUM; ♂ FORCEPS USUALLY OF COMPLICATED STRUCTURE.

A. Antennæ pectinate, 13-jointed, in both sexes; ♂ forceps of simple structure. Rostrum prolonged.

Div. 1. Antennæ bipectinate; first flagellar joint short, without a branch; second to seventh with a pair of short branches; four long cylindrical terminal joints.

Div. 2. Antennæ unipectinate; first flagellar joint without a branch; second to seventh with a single short branch; four long cylindrical terminal joints.

Ozodicera, Macq.

B. Antennæ simple, sometimes serrate.

1. Antennæ short in both sexes, with a variable number of joints; and a certain number of linear terminal joints. Rostrum short and stout.

a. Genitalia not protruding in either sex.

Antennæ 7-jointed (♂ in both sexes); first joint of scapus nearly half the length of entire antennæ. Palpi with terminal joint short. *Semnoles*, Westw.

Antennæ 10-jointed; first joint of scapus not one-third the length of entire antennæ. Palpi with the terminal joint long, flagelliform. *Leptotarsus*, Guérin.

b. Genitalia protruding in both sexes; ♂ forceps of rather simple structure.

Antennæ 12-jointed in ♂, 14-jointed in ♀; linear terminal joints beset with bristly hairs. *Acracantha*, Sk.

2. Antennæ usually short, sometimes very long, normally 13-jointed in both sexes, sometimes more.

a. Genitalia protruding in both sexes.

* Antennæ serrate.

Nasus short (?). Abdomen short, pubescent. Palpi with the terminal joint long, flagelliform. Venation as in *Tipula*. *Stygeropsis*, Loew.

Nasus long. Abdomen long, cylindrical, glabrous. Palpi with terminal joint long, flagelliform. ♂ forceps of rather simple structure. Last section of second longitudinal vein arcuate. *Ischnotoma*, Sk.

** Antennæ simple, often filiform.

Rostrum shorter than head. Palpi with terminal joint short. ♂ forceps with large foliaceous appendages. *Longurio*, Loew.

Rostrum as long as head. Palpi with terminal joint long, flagelliform. ♂ forceps not incrassate, short. Last section of second longitudinal vein arcuate. *Holorusia*, Loew.

Rostrum long. Palpi with terminal joint long, flagelliform. ♂ forceps moderately incrassate. *Tipula*, Linn.

Rostrum short. Palpi with terminal joint long, flagelliform. Antennæ 13- to 19-jointed. Second posterior cell usually sessile. Body-colour usually yellow, with three black stripes in the thorax. ♂ forceps moderately incrassate. *Pachyrrhina*, Macq.

b. Genitalia not protruding in either sex.

♂ antennæ sometimes very long and filiform, often as short as in ♀. Front rather broad, with a tubercle above the antennæ (more prominent in ♂ than in ♀). Body short. *Macromastix*, O.-Sack.

L NO DISTINCT NASUS TO ROSTRUM; ♂ FORCEPS OF SIMPLE STRUCTURE.

A. Antennæ pectinate, with a variable number of joints.

1. *Antennæ 13-jointed in ♂, 15-jointed in ♀.*

a. ♂ antennæ with long branches.

* *Second submarginal and discal cells in complete contact.*

Genus 5. PTILOGYNA, Westwood.

Ptilogyna, Westw., Lond. and Edin. Phil. Mag. VI. p. 280, 1835; Zool. Journ. V. No. 20, p. 448, 1835; Macquart, Dipt. Exot. I. p. 45, 1838; Westw., Trans. Ent. Soc. Lond. 1881, p. 381; G.-Sacken, Studies, I. p. 175, 1886.

First longitudinal vein joining before, at, or a little beyond origin of anterior branch of second longitudinal vein; second sub-

marginal cell in contact with discal cell, the small cross-vein wanting; second posterior cell sessile. Front moderately broad, with a distinct tubercle above the antennæ. Rostrum shorter than the head; nasus wanting. Antennæ 13-jointed in ♂, 15-jointed in ♀; flagellar joints in ♂ with three rows of very long branches, in ♀ with two rows of very short ones. Genitalia of ♂ not incrassate, of simple structure; the basal piece bearing a curved, horny, pointed, appendage, with a fleshy lobe beneath. (Pl. vi., fig. 28.)

The male antennæ (Pl. vi., fig. 29) have the first flagellar joint short with a single long branch beneath; the second to seventh with a long branch on each side at the base and another at the middle beneath; the eighth joint is considerably longer than the seventh, has the usual two basal branches, but the third is short and situated near the apex beneath. Westwood's figure of the ♂ antennæ (Trans. Ent. Soc. 1881, pl. xix. fig. 14a) shows exactly their character. The female antennæ have only a very short tooth-like branch beneath on the first flagellar joint, the second to eighth with a short branch on each side at the base, those on the outer side nearly twice the length of those on the inner; five short, simple, terminal joints. Westwood says that the ♀ antennæ are 14-jointed, but I can distinctly see five terminal joints. The terminal joints, however, may be subject to modification.

The valves of the ♀ ovipositor are straight and pointed.

The first longitudinal vein sometimes terminates in the anterior branch of the second longitudinal vein, though more often immediately before its base. The complete contact of the second submarginal and discal cells is constant in all specimens examined.

397. *PTILOGYNA RAMICORNIS*, Walker. (Pl. iv., fig. 6.)

Tipula ramicornis, Walk., Ent. Mag. II. p. 469, 1835; *Ptilogyne ramicornis*, Westwood, Lond. and Edin. Phil. Mag. VI. p. 280, 1835; *P. marginalis*, West., Zool. Journ. V. p. 448, pl. 22, figs. 14-15, ♀, 1835; *P. fuliginosa*, Macquart, Dipt. Exot. I. p. 46, pl. 3, f. 2, 1838; *P. Macquarti*, Loew, Linn. Entom. V. p.

392, 1851 ; Osten-Sacken, Cat. N. Amer. Dipt. p. 222, Note 45, 1878 ; *P. picta*, Schiner, Dipt. Novara Exp. Zool. Theil, Bd. II. p. 38, 1868 ; *P. ramicornis*, Westw., Trans. Ent. Soc. Lond. 1881, p. 382, pl. 19, f. 14 ; O.-Sacken, Studies on Tipulidæ, I. 1886, p. 176.

♂.—Length of antennæ.....	0·280 inch	...	7·10 millimètres.
Expanse of wings.....	0·680 × 0·160	...	17·26 × 4·06
Size of body.....	0·720 × 0·090	...	18·28 × 2·27
♀.—Length of antennæ.....	0·180 inch	...	4·56 millimètres.
Expanse of wings.....	0·760 × 0·180	...	19·32 × 4·56
Size of body.....	1·000 × 0·115	...	25·40 × 2·92

Brownish-ochreous. Front, basal joints of antennæ, rostrum (above), and collare, ochreous ; last four joints in ♂ antennæ, all the branches in both sexes, the palpi and suctorial labella, fuscous-brown or black ; rostrum usually brownish at the sides and beneath. Thorax sub-nitidous, more or less deeply tinged with brown on the pronotum, from which three brownish lines often proceed to the suture ; pleuræ with a brownish oblique stripe or often merely a spot between humeri and origin of wings. Halteres with slightly infuscated club. Abdomen with a longitudinal black (often broad) stripe above and beneath from the anterior margin of second segment ; the segments (except the first) very narrowly bordered with black laterally and posteriorly ; genitalia brownish-ochreous in both sexes. Femora broadly ringed with black at the apex ; tibiæ slightly black or fuscous at the apex ; tarsi obscure. Wings hyaline, bordered with pale brown anteriorly, the veins (except sixth and seventh longitudinal) clouded with darker brown ; four small, roundish, hyaline spots in the brown border ; first midway between humeral cross-vein and origin of præfurca ; second immediately before origin of præfurca ; third beneath anterior branch of second longitudinal, and fourth (sometimes very indistinct) at the tip of the last named vein ; posterior half of wings lightly infuscated with greyish. First longitudinal vein joining before, at or a little beyond the base of anterior branch of second longitudinal

vein; second submarginal cell one-third longer than the first posterior cell, in contact with the discal; discal cell septangular in consequence of the sessile character of the second posterior cell.

Hab.—Sydney and other localities in N.S.W. (Masters); Waterloo Swamps, near Sydney, eleven specimens in March (Helms and Skuse); Glass Mountains, Queensland (C. J. Wild).

Obs.—Macquart taking his specimens to have come from N. America, erroneously identified and described them as *Ptilogyna fuliginosa*, Say, originally characterized by Say as a native of that country, under the generic title *Ctenophora*, but considered a *Tipula* by modern authors. Loew discovered the error and suggested that Macquart's species should be called *P. Macquarti*; it had however, been twice characterized and named as an Australian insect by Walker and Westwood three years previously to Macquart's publication. I cannot understand how Schiner could conceive his *P. picta* to be distinct from this species, his description agreeing almost word for word with that drawn up by Walker in 1835.

**** *Second submarginal and discal cells not in contact.***

Genus 6. PLATYPHASIA, gen.nov.

First longitudinal vein joining near the base of the anterior branch of second longitudinal; the ultimate section of the branch appearing as a continuation of the first longitudinal; second submarginal cell separated from discal by the small cross-vein; second posterior cell petiolate. Front moderately broad, convex, without a tubercle above the antennæ. Rostrum as long as the head; nasus wanting. Antennæ 13-jointed in ♂, the second to eighth flagellar joints with a single, very long, branch on the outer side. ♂ genitalia of simple structure.

The elegant insect for which the generic name is proposed is certainly more closely allied to *Ptilogyna* than to any other known genus, but may easily be distinguished by the peculiar character of the antennæ (Pl. VI., fig. 30), the absence of a tubercle on the front, the length of the first posterior cell and presence of small

cross-vein, and the petiolated second basal cell. Baron Osten-Sacken (Studies I., p. 177) does not seem to attach more than specific importance to the character of the second submarginal cell in *Ptilogyna*, but that cell seems always to the same extent in contact with the discal in all specimens of *Ptilogyna*; whereas never in any of the related insects have I found any approach to a diminution in the length of the first posterior cell. Consequently I am led to regard this as one of the constant distinguishing characters between *Ptilogyna* and *Platyphasia*. The male holding-forceps are of simple structure, and seem similar to those of *Ptilogyna*, but they cannot be satisfactorily studied in the dried specimen before me.

The tibial spurs are longer than in *Ptilogyna*.

398. PLATYPHASIA PRINCEPS, sp.n. (Pl. iv., fig. 7).

♂.—Length of antennæ.....	0·160 inch	...	4·06 millimètres.
Expanse of wings.....	0·670 × 0·160	...	17·01 × 4·06
Size of body.....	0·730 × 0·090	...	18·54 × 2·27

Black. Head and rostrum with a somewhat hoary pubescence; antennæ with a somewhat hoary bloom; first joint of scapus moderately long, second flattened, cyathiform or annular; first to seventh flagellar joints progressively, but very slightly, lengthening; eighth $\frac{1}{3}$ longer than seventh; three terminal joints about the length of first flagellar joint, but very slender; the second to eight joints with a single long branch at the base on the outer side. Thorax: humeri and collare tinged with reddish-brown; lateral margins, and two short inverted cuneiform stripes hoary with a pale pubescence; pleuræ with hoary patches and pale pubescence; lateral callosity of the metanotum pointed, reddish-brown; above origin of wings and from centre of suture to scutellum hoary; scutellum and metanotum more or less reddish-brown on the margins, hoary. Halteres brown. Abdomen with the first segment hoary grey, and lateral patches of same on the second, third, and fourth segments; fifth and sixth segment almost entirely hoary grey, the seventh only slightly bordered

laterally; genitalia brown. Femora with not quite the basal half reddish-fulvous; hind tibiae with an indistinct brownish ring near the base. Wings a little infuscated, darker in the costal cell; stigma small, distinct; veins black. Ultimate section of anterior branch of second longitudinal vein appearing as a continuation of the first longitudinal; second posterior cell with a short petiole; discal cell pentangular.

Hab.—Moonbar, Mount Kosciusko, 3-3500 feet, N.S.W. (Helms). A single specimen in March. *In Coll. Australian Museum.*

b. ♂ antennae with short branches.

Genus 7. *PLUSIOMYIA*, gen. nov.

First longitudinal vein joining anterior branch of second longitudinal vein near the base, the terminal portion of the branch appearing as a continuation of the first longitudinal; second submarginal cell separated from discal by the small cross-vein; second posterior cell sessile, but usually in not more than punctiform contact with the discal. Front narrow, flattened, almost in same plane with front of rostrum. Rostrum usually considerably longer than the head, with minute, inconspicuous pubescence; nasus wanting. Antennae 13-jointed in ♂, 15-jointed in ♀; in both sexes a certain number of the flagellar joints provided with a pair of short branches. Tarsi very long in the hind legs. ♂ genitalia not incrassate, of simple structure.

The insects included in this genus, though evidently allied to *Ptilogyna* and *Platyphasia*, offer certain striking differences, but may be divided under two sections. The first division includes species *P. gracilis*, Wlk., *P. spectabilis*, Sk., and *P. Olliffi*, Sk., and are typical of the genus as above defined; the second includes two species, *P. lineata*, Sk., and *P. inornata*, Sk., which are unfortunately known only by ♀ specimens. The peculiar flattened head, almost in line with the front of the long rostrum, is constant throughout; but the front is narrower in the first

division, and the antennæ are different. In the *P. gracilis* division the first joint of the scapus is moderately long (Pl. VI., fig. 31), in *P. lineata* it is longer, and in *P. inornata* very long, nearly one-third the length of entire antennæ (Pl. VI., fig. 32); in the former there are always four simple terminal joints in the ♂, six in the ♀, but in *P. lineata* (♀) there are four, and in *P. inornata* (♀) six simple terminal joints, the second to ninth flagellar joints being branched instead of the second to seventh as in all the other species. If the males of *P. lineata* and *P. inornata* exhibit any important difference in the structure of the antennæ, these two species probably should be referred to another genus. However, I believe *P. inornata* to be the same as the insect referred to by Baron Osten-Sacken (Studies I. p. 178), in which the branches of the antennæ are equally long in both sexes, a third about the middle, first joint remarkably long, &c. In the first division the tarsi are very long, and the second posterior cell is only in punctiform contact with the discal; while in the second the hind tarsi are only about one-third longer than the tibiæ, and the second posterior cell is in complete contact with the discal. Certainly the latter may not be a reliable character.

399. *PLUSIOMYIA GRACILIS*, Walker. (Pl. IV., fig. 8.)

Pedicia gracilis, Walk., List Dipt. Brit. Mus. I. p. 37, 1848 (*sine patria*); *Ozodicera longipedalis*, Westwood, Trans. Ent. Soc. Lond. p. 503, pl. 3, figs. 4, 4a, 4b, 1876; Trans. Ent. Soc. Lond. p. 381, 1881; O.-Sacken, Studies, I. p. 177, 1886.

♂.—Length of antennæ.....	0·240 inch	...	6·09 millimètres.
Expanse of wings.....	0·850 × 0·180	...	21·58 × 4·56
Size of body.....	0·850 × 0·100	...	21·58 × 2·54
♀.—Length of antennæ.....	0·300 inch	...	7·62 millimètres.
Expanse of wings.....	1·060 × 0·220	...	26·94 × 5·58
Size of body.....	1·350 × 0·150	...	34·28 × 3·81

Head ochreous, with a whitish bloom; rostrum and basal joints of antennæ fulvous, sometimes more obscure; flagellar joints brown; suctorial labella and palpi black; ♀ antennæ longer than

those of ♂; first flagellar joint with a more or less distinct short branch beneath near the apex. Thorax dull brown, with two short longitudinal stripes (from humeri) and the margins ochreous; sometimes also an indistinct intermediate line from collare to suture; brown stripe from pronotum to origin of wings, followed beneath on the pleurse by two broad hoary white stripes separated by a narrow brown one; pectus more or less brown; an oblong brown spot between origin of wings and scutellum; scutellum and metanotum with a hoary bloom. Halteres brown. Abdomen dull greyish-brown, with a more or less fulvous tint, the first few segments almost hoary; a brown dorsal stripe extending the whole length of the abdomen; also a similar stripe along the lateral border of the segments; genitalia fulvous-brown. Coxæ with a hoary bloom; the remainder of the joints brown, the basal portion (or sometimes the greater portion) of femora and tibiæ more fulvous. Wings whitish, hyaline posteriorly, with brown stripes on the anterior half; anterior margin between costa and fourth longitudinal vein (except an oblong clear space before origin of præfurca) brown, from base of wing to inner end of discal cell and anterior branch of second longitudinal; fifth longitudinal vein bordered anteriorly with a brown stripe for its entire length; also an oblique stripe extending from lower extremity of great cross-vein to tips of second and third longitudinal veins; seventh longitudinal vein very distinct, slightly infuscated. First longitudinal vein joining anterior branch of second longitudinal at or a little beyond its base; second posterior cell sessile, in punctiform contact with the discal, or with a very short petiole; discal cell pentangular.

Hab.—N.S.W. (Masters and Skuse). Several specimens (only one ♂).

Obs. 1.—In one specimen there is an oblique cross-vein in the first posterior cell, joining near inner end of second posterior cell.

Obs. 2.—This insect, first described by Walker under the generic name *Pedicia* from an unknown locality, was afterwards characterized by Westwood as an *Oxodicera*, from Australia. Westwood

(Trans. Ent. Soc. Lond. 1881, p. 381) remarks that *Pedicia gracilis*, Walk., is marked in the British Museum as from New Zealand. It may be found there, but I have not yet heard of its occurrence.

400. *PLUSIOMYIA OLLIFFI*, sp.n. (Pl. iv., fig. 9.)

♂.—Length of antennæ.....	0·210 inch	...	5·33 millimètres.
Expanse of wings.....	0·790 × 0·210	..	20·05 × 5·33
Size of body.....	0·625 × 0·120	...	15·86 × 3·04

Head brown ; rostrum and basal joints of antennæ lighter brown ; suctorial labella, palpi, and flagellar joints black ; first flagellar joint with a distinct short branch beneath near the apex. Thorax dusky brown, opaque, with a narrow median stripe (visible in a certain light only) ; lateral margins somewhat ochreous ; brown from pronotum (and collare) to origin of wings ; followed on the pleuræ with a hoary white stripe, beneath which is first a broad brown stripe followed by a broad hoary one next to the coxæ ; pectus ochreous-brown ; an oblong brownish-ochreous spot between origin of wings and scutellum ; scutellum dark brown ; metanotum brown, somewhat hoary. Halteres black. Abdomen entirely dusky brown. Coxæ hoary. Remaining joints browish-ochreous or testaceous, dusky brown towards tips of femora and tibiæ. Wings with the anterior portion (above the fifth longitudinal vein) brown (paler towards the apex), with two large and three small white spots ; the posterior portion infuscated with greyish ; white below the fifth longitudinal, particularly towards anal angle. First large spot longitudinal, flattened-triangular, situated at distal end of second basal cell, one of its sides parallel with and close to great cross vein ; second large spot obliquely situated, oblong, about equal in size to first, extending from posterior margin of discal cell to costa (immediately beyond tip of anterior branch of second longitudinal vein) ; a small oblong spot immediately before origin of præfurca, another similar one in fourth posterior cell, and lastly a round dot in third posterior cell near its inner end. Ultimate portion of anterior branch of second longitudinal vein

appearing as a continuation of the first longitudinal; second posterior cell in punctiform contact with the discal; discal cell pentagonal.

Hab.—Mount Wilson, Blue Mountains, N.S.W. (A. Sidney Olliff). One specimen in January.

Obs.—The length of the body as above stated is undoubtedly below the mark, the specimen before me being much shrunken.

401. *PLUSIOMYIA* *SPECTABILIS*, sp.n.

♂.—Length of antennæ.....	0·210 inch	...	5·33 millimètres.
Expanse of wings.....	0·790 × 0·210	...	20·05 × 5·33
Size of body.....	1·150 × 0·115	...	29·21 × 2·92

Head grey; rostrum and basal joints of antennæ light brown; suctorial labella, palpi, and flagellar joints black; first flagellar joint with a short tooth-like branch beneath near the apex; branches on the following six joints about $\frac{1}{3}$ longer than the joints. Thorax dull slaty-grey, with faint indication of a yellowish median line; whitish reflections on the lateral borders; pleuræ hoary with two narrow longitudinal brown stripes, the first from pronotum (and collare) to origin of wings, the second indistinct, running across the middle of pleuræ; scutellum and metathorax with a hoary bloom. Halteres ochreous, with a black club. Abdomen greyish-brown, with indistinct blackish dorsal and lateral stripes on the first three or four segments; the terminal segments more completely suffused with blackish. Coxæ with a hoary bloom. Femora fulvous-brown, black at the apex. Tibiæ black, fulvous-brown at the base. Tarsi black. Wings tinted anteriorly (above the fifth longitudinal vein) with pale brown, paler towards the apex, darker towards the base, with a whitish streak extending from middle of second basal cell to costa (between the tip of the second longitudinal vein and its anterior branch); posterior margin greyish, beneath the fifth longitudinal vein whitish, especially towards anal angle. Ultimate section of the anterior branch of the second longitudinal

vein appearing as a continuation of the first longitudinal; second posterior cell in punctiform contact with discal cell; discal cell pentangular.

Hab.—Benalla, Victoria (Helms). A single specimen in November.

402. *PLUSIOMYIA LINEATA*, sp.n. (Pl. v., fig. 10.)

♀.—Length of antennæ.....	0·165 inch	..	4·18 millimètres.
Expanse of wings.....	0·630 × 0·150	...	16·00 × 3·81
Size of body.....	0·860 × 0·090	...	21·83 × 2·27

Head black; rostrum, suctorial labella and palpi brown; antennæ fulvous deepening into brown, the branches dark brown or blackish; first flagellar joint short, not $\frac{1}{3}$ the length of first joint of scapus, with a short branch about the middle beneath; second to ninth flagellar joints with a pair of lateral branches at the base, most of them twice the length of the joints; four terminal cylindrical joints. Thorax black, opaque; prothorax, pleuræ and metathorax ferruginous or reddish-fulvous; metanotum with a large square black spot almost covering its entire surface. Halteres brown. Abdomen greyish-black, the first few segments fulvous with a dorsal and lateral black stripes which widen and completely suffuse the following segments; ovipositor brownish-ferruginous. Coxæ and femora ferruginous or fulvous, the femora with a brown ring at the apex; tibiæ and tarsi rather more brownish than the femora. In the hind legs the tarsi not much (about $\frac{1}{5}$) longer than the tibiæ. Wings with a pale brownish tint, with a whitish narrow arcuated streak from second basal cell (opposite origin of præfurca), through the discal, including small portion of distal end of first basal cell, and finally entirely filling first posterior cell. Ultimate section of the anterior branch of the second longitudinal vein appearing as a continuation of the first longitudinal; second posterior cell in complete contact with the discal, the latter consequently hexagonal.

Hab.—King George's Sound, Western Australia (Masters). A single specimen.

403. *PLUSIOMYIA INORNATA*, sp.n.

♀.—Length of antennæ.....	0.180 inch	...	4.56 millimètres.
Expanse of wings.....	0.630 × 0.150	...	16.00 × 3.81
Size of body.....	0.760 × 0.090	...	19.32 × 2.27

Head dull plumbeous; rostrum, suctorial labella and palpi brown; joints of the scapus fulvous, the first long, nearly four times the length of first flagellar joint; flagellar joints brown, with dusky branches, first with a short tooth of a branch beneath the apex; second to seventh with a pair of branches laterally at the base, and a minute tooth of a branch a little beyond the middle beneath; longest lateral branch scarcely twice the length of the joints; six short cylindrical terminal joints. Thorax brown, dull, with indistinct indication of longitudinal stripes; pronotum and lateral margin ochreous or greyish, with an indistinct brown line on pleuræ from behind head to origin of wings; pleuræ light ochreous-brown, somewhat hoary; scutellum and metanotum brown, the posterior border of latter paler. Halteres brown. Abdomen brown, with indistinct traces of dorsal and lateral dark stripes; posterior edge of segments somewhat ochreous; ovipositor ochreous-brown. (Legs wanting in the specimen before me.)* Wings subhyaline, with a very pale brownish tint, ochreous in the costal cell; stigma distinct; veins brown. Ultimate section of the anterior branch of the second longitudinal vein appearing as a continuation of the first longitudinal; second posterior cell in complete contact with the discal, the latter consequently hexagonal.

Hab.—Sydney (Masters). A single specimen.

Obs.—This is apparently the species referred to by Osten-Sacken in his *Studies on Tipulidæ*, I., p. 178.

B. Antennæ simple.

1. *Antennæ 11-jointed in ♂, 13-jointed in ♀.*

* Probably somewhat similar to those in *P. lineata*.

Genus 8. HABROMASTIX, gen.nov.

First longitudinal vein joining anterior branch of the second longitudinal vein at or near the base; præfurca short, not much longer than great cross-vein; second posterior cell sessile or petiolate. Front broad; *rather convex*. *Rostrum about as long as the head*, distinctly pubescent; nasus wanting. *Antennæ 11-jointed in ♂, about the length of or longer than entire body; 13-jointed in ♀, about the length of thorax.* ♂ genitalia of simple structure.

Rostrum about the length of the head, sometimes distinctly hairy; nasus wanting; palpi with the first three joints of about equal length, the second thickened towards the apex; terminal joint equal in length to the two preceding joints in *H. cinerascens* and *H. ornatipes*, the length of the three preceding joints in *H. remota*. Antennæ long, more or less distinctly covered with dense erect hairs; first joint of the scapus obconical, twice the length of the second, the latter cyathiform; flagellar joints progressively decreasing in length and thickness; ♂ antennæ 11-jointed, more or less the length of the entire body; ♀ 13-jointed, more or less the length of the thorax (Pl. vi., fig. 34, *H. cinerascens*). Front broad; *rather convex*. Collare short. ♂ forceps narrower than the preceding segment, of simple structure (Pl. vi., fig. 33, *H. cinerascens*); ♀ ovipositor with straight valves; the latter long in *H. ornatipes*, the upper and lower being about equal in length, short in *H. cinerascens*, the lower a little shorter than the upper. Legs long and slender; in *H. remota* very long and very slender; tibiæ with minute spurs; ungues minute. In ♂ the tarsi of all the legs twice the length of tibiæ, in ♀ about $\frac{1}{3}$ longer than the tibiæ. Wings lanceolate; anal angle moderately developed. Auxiliary vein joining the first longitudinal vein at inner end of stigma; first longitudinal vein joining anterior branch of second longitudinal vein at or near the base; the latter branch obliquely situated; præfurca short, scarcely longer than great cross-vein in *H. remota*; second posterior cell sessile or with an extremely short petiole in *H. cinerascens* and *H. ornatipes*, with a long petiole in *H. remota*, on account

of the smallness of the discal cell; discal cell pentangular, half the length of the first posterior cell in *H. cinerascens* and *H. ornaticipes*, not quite the length of the petiole of second submarginal cell in *H. remota*; fifth posterior cell in punctiform contact with discal at the middle of its length.

404. *HABROMASTIX CINERASCENS*, sp.n. (Pl. v., fig. 11.)

♂.—Length of antennæ	0.470 inch	...	11.93 millimètres.
Expanse of wings.....	0.600 × 0.135	...	15.24 × 3.42
Size of body.....	0.530 × 0.060	...	13.46 × 1.54
♀.—Length of antennæ	0.180 inch	...	4.56 millimètres.
Expanse of wings.....	0.640 × 0.150	...	16.25 × 3.81
Size of body.....	0.530 × 0.060	...	13.46 × 1.54

Slaty-grey, opaque. Front with a brown median stripe, broader posteriorly. Rostrum hairy, usually tinged with black at the tip and sides; suctorial labella and palpi usually black or brown; flagellar joints of antennæ black or brown; ♂ antennæ 11-jointed, about $\frac{2}{3}$ the length of entire body, flagellar joints long, filiform, densely clothed with minute erect hairs, gradually decreasing in length, the terminal joint short, less than $\frac{1}{2}$ the length of preceding joint; ♀ 13-jointed, about length of thorax, flagellar joints gradually decreasing in length, clothed with extremely minute hairs. Thorax with white hairs; humeral pits and suture between pronotum and collare black; four prominent dark brown stripes before the suture, intermediate pair approximate, extending from pronotum to suture, lateral ones short, extending from below humeri to suture; a pair of dark brown spots on each side behind the suture and opposite the lateral stripes, the anterior spot small, roundish, the hinder one large, almost triangular; transverse suture black towards the middle. Halteres ochreous, with infuscated club. Genitalia testaceous. Legs black, the basal portion of femora and the trochanters fulvous. Wings with very much the appearance of ground glass; some-

what ochreous towards the base, the extreme base and the veins black; the base and apex of first, and whole of second basal cell, discal cell, first posterior cell, basal half of fourth posterior cell, a small roundish spot immediately beyond the anterior branch of the second longitudinal vein, and two or three streaks in the hinder portion of the wing, whitish: the white imparting a streaked appearance to the wing; stigma pale brownish. First longitudinal vein joining anterior branch of second longitudinal at or a little beyond the base; inner end of first posterior cell beyond that of either the second submarginal or discal cell; second posterior cell with a very short petiole, or sessile, in punctiform contact with the discal; discal cell half the length of first posterior cell, in punctiform contact with the fifth posterior cell.

Hab.—Walcha, New England, N.S.W. (Mr. J. F. Schofield); Moonbar, Monaro, N.S.W., 3-3500 ft. (Helms); *six* ♂ *specimens in Coll. Aust. Mus.* March.

Obs.—Mr. Schofield informs me that this insect came out of the ground in swarms during the month of March.

405. HABROMASTIX ORNATIPES, sp.n.

♀.—Length of antennæ.....	0·210 inch	...	5·33 millimètres.
Expanse of wings	0·600 × 0·150	...	15·24 × 3·81
Size of body	0·750 × 0·070	...	19·05 × 1·77

Head greyish, much tinged with blackish on the front; face, rostrum and antennæ brown; rostrum appearing glabrous under a low power; palpi dark brown or black; antennæ 13-jointed, longer than head and thorax taken together, minutely pubescent. Collare and pronotum tinged with blackish. Thorax very similar to that of *H. cinerascens*, yellowish ashy-grey, opaque, with three brown stripes before the suture; intermediate one broad; lateral ones narrow, short; a pair of brown spots on each side behind the suture exactly as in *H. cinerascens*; transverse suture, anterior margin of scutellum, sides of metathorax, and median stripe and

hinder border of metanotum, brown. Halteres dusky brown. Abdomen testaceous, levigate; first segment greyish, opaque, with a brownish marking; ovipositor dark reddish-brown, nitidous. Coxæ grey. Trochanters testaceous. Femora testaceous, with a broad dark brown or black ring at apex. Tibiæ and tarsi dark brown or black, the former testaceous at the base. Wings very similar to those of *H. cinerascens*, only darker, and having some yellow spots; a yellowish oblique marking from costa to fifth longitudinal vein at basal third of second basal cell, the included portion of the fifth vein bright yellow; a yellowish spot immediately before stigma; not quite so much whitish in second basal cell as in *H. cinerascens*, only a small spot in fourth posterior cell, and scarcely any traces on posterior half of wing. Venation as in *H. cinerascens*, except that the discal cell is a little shorter; stigma brown.

Hab.—Rodd Island, Port Jackson (Skuse). One specimen at end of March.

406. *HABROMASTIX REMOTA*, Walker. (Pl. v., fig. 12).

Tipula remota, Wlk., List Dipt. Brit. Mus. I. p. 73, 1848.

♂.—Length of antennæ..	0·640 inch	...	16·78 millimètres.
Expanse of wings.....	0·600 × 0·120	...	15·24 × 3·04
Size of body.....	0·500 × 0·060	...	12·70 × 1·54

Head brownish-grey, tinged with brown on the front; rostrum brown, pubescent; suctorial labella and palpi dark brown; antennæ brown, the joints of scapus and first two or three flagellar joints more fulvous; antennæ longer than the entire body, the flagellar joints long, filiform, densely adorned with long erect hairs; the terminal joint less than $\frac{1}{4}$ the length of preceding joint. Thorax brown, levigate, the lateral borders and three narrow stripes before the suture, grey; the stripes extending from anterior border to, and slightly converging towards, the suture; behind the suture, above the origin of the wings and before the scutellum, more or less hoary greyish; pleuræ hoary greyish; metanotum grey, brown

posteriorly. Halteres with a blackish club. Abdomen brown, the terminal segments black, each segment bordered posteriorly and more or less laterally with yellowish-grey; forceps deep brown. Legs very long and slender, brownish-fulvous, the tips of femora and tibiae brown. Wings with a pale brownish tint, marked with about twelve irregular whitish spots; the latter usually crossing the veins, the included portions being yellowish; the spots on the apical portion of the wing smaller than the others; veins and stigma brown, distinct. First longitudinal vein joining anterior branch of second longitudinal close to the base; inner ends of second submarginal, first posterior and discal cell in one line; second posterior cell with a long petiole; discal cell small, not quite the length of petiole of second posterior cell; fourth posterior cell longer and narrower than usual; fifth posterior cell in punctiform contact with the discal cell.

Hab.—Lawson, Blue Mountains, N.S.W. (Masters). One specimen in January.

Obs.—The above-described answers to Walker's description of *T. remota*, from "New Holland."

2. *Antennæ 13-jointed* (? in both sexes).

Genus 9. PHYMATOPSIS, gen. nov.

First longitudinal vein joining anterior branch of second longitudinal vein near the base; rhomboid cell small; præfurca short, rather longer than the great cross-vein; second posterior cell with a short petiole or sessile. Front moderately broad, *with a prominent tubercle immediately above the base of antennæ*. Rostrum considerably longer than the head, distinctly pubescent; nasus wanting. *Antennæ 13-jointed in ♂, short, the terminal six or seven joints distinctly smaller*. ♂ genitalia of simple structure.

Rostrum considerably longer than the head, densely covered with short hairs; nasus wanting; palpi with the first and third joints shortest, of about equal length, the terminal joint long,

flagelliform. Antennæ a little longer than the rostrum; first joint of scapus obconical, about twice the length of the second, second rather long, cyathiform; flagellar joints progressively diminishing in length to the last, narrower at the base, beset with minute hairs (Pl. VI., fig. 35). Front moderately broad, somewhat flattened, with a prominent tubercle immediately above the basal joints of the antennæ. ♂ forceps narrower than the preceding segment, of simple structure (Pl. VI., fig. 36). Legs long and slender; owing to the great length of the metatarsal joint the tarsi are more than $2\frac{1}{2}$ times the length of the tibia: tibial spurs short; unguis minute. Wings lanceolate; anal angle only slightly developed. First longitudinal vein with the cross-vein close to its tip, joining the anterior branch of the second longitudinal near the middle, consequently the rhomboid cell very small; anterior branch of second longitudinal sinuated; præfurca arcuated at base, short, almost in line with the remainder of the vein; inner ends of second submarginal and first posterior cells obliquely in line; discal cell oblong, pentangular, its inner end forming an obtuse angle with the inner ends of the second submarginal and first posterior cells; second posterior cell in punctiform contact with discal, or with a short petiole; fifth posterior cell in punctiform contact with discal near its inner end; seventh longitudinal almost parallel with the margin.

This genus is closely related to *Habromastix*, but may be readily distinguished from it by the character of the antennæ, tubercle on the front, long rostrum, and venation.

407. *PHYMATOPSIS NIGHIROSTRIS*, sp.n. (Pl. v., fig. 13.)

♂.—Length of antennæ.....	0.085 inch	...	2.14 millimètres.
Expanse of wings.....	0.600 × 0.150	...	15.24 × 3.81
Size of body.....	0.560 × 0.080	...	14.24 × 2.02

Head slaty-grey, or more brownish; frontal tubercle, face, and joints of scapus fulvous; rostrum, palpi, and suctorial labella black or deep brown; the rostrum shining, densely clothed with

black hairs; flagellar joints of antennæ brown. Thorax slaty-grey, opaque, clothed with short pale hairs, with four brown stripes, the intermediate two cuneiformly narrowed posteriorly, extending from anterior margin almost to the suture, the lateral ones short, reaching suture; a pair of brown spots on each side behind the suture, the anterior spot small, roundish, the hinder one large, of indefinite shape; pleuræ and metathorax greyish-ochreous. Halteres brown, fulvous at extreme base of stem. Abdomen black, levigate, clothed with short pale hairs; the first segment dull greyish-brown or greyish-ochreous; and the anterior half of the second segment nitidous, transparent, fulvous-brown (with a dark brown median dorsal stripe in one specimen); holding-forceps brown. Legs very long, black; the coxæ and basal portion of femora ochreous or fulvous. Wings semi-transparent, with a greyish tint, brownish in the costal cell; stigma ochreous-yellow. The venation as described in the generic diagnosis.

Hab.—Sydney (Masters and Skuse). Two specimens. April.

II. DISTINCT NASUS TO ROSTRUM; ♂ FORCEPS USUALLY OF COMPLICATED STRUCTURE.

B. Antennæ simple, sometimes serrate.

1. *Antennæ short in both sexes, with a variable number of joints; and a certain number of linear terminal joints. Rostrum stout and short.*

- a. Genitalia not protruding in either sex.

Genus 10. SEMNOTES, Westw.

Semnotes, Westw., Trans. Ent. Soc. Lond. 1876, p. 501; O.-Sacken, Studies, I., p. 181, 1886.

First longitudinal vein joining the anterior branch of the second longitudinal in such a manner that the ultimate section of the branch appears as a *straight continuation of the first vein*; præfurca as long as or a little longer than great cross-vein; second

posterior cell petiolate. Front broad, slightly gibbose anteriorly. Rostrum very short, arched in front, with a short obtuse nasus. *Antennæ* 7-jointed (? in both sexes), shorter than the head. *Palpi* with the last joint short. Genitalia in both sexes inconspicuous.

Rostrum not half the length of the head; nasus obtuse, hairy; palpi short, the last joint about the length of the third or shorter (Pl. VI., fig. 38). *Antennæ* somewhat shorter than the head; 7-jointed (? in ♂); first joint of scapus stout, cylindrical, more than $\frac{1}{3}$ length of entire antennæ, second somewhat narrower, elongate, cyathiform; first flagellar joint as long as, but somewhat narrower than, second joint of scapus (rather longer and narrower in *S. imperatoria*), obovate; remaining joints linear (Pl. VI., fig. 37). Front broad, a little gibbose anteriorly above the antennæ. Thorax large and gibbose, considerably larger in ♀ than in the ♂; suture distinct; abdomen less than twice the length of the thorax, robust, clavate, the second segment truncate-conical; third to fifth segments wide, short; the rest short, diminishing in width; genitalia in both sexes inconspicuous, difficult to study in dried specimens. Legs long and slender; in the ♂ the tarsi more than twice the length of the tibiæ, in ♀ less than twice their length; tibiæ armed with a pair of short spurs; unguis strong, hooked; empodia distinct. Wings large, divaricate, shorter and narrower in the ♂ than in the ♀; anal angle most distinct in the ♀, not so prominent in the ♂. Auxiliary vein reaching the first longitudinal in *S. ducalis* before, in *S. imperatoria* opposite, inner end of first posterior cell, connected at the tip to costa by a cross-vein; the ultimate section of the anterior branch of the second longitudinal appearing as a continuation of the first longitudinal; second posterior cell petiolate; discal cell oblong, pentangular, in punctiform contact with fifth posterior cell, or connected to it by a very short vein, about the middle of its length.

408. *SEMNOTES DUCALIS*, Westwood. (Pl. v., fig. 14.)

S. ducalis, Westw., Trans. Ent. Soc. Lond. p. 502, pl. III. fig. 2a, 1876.

♀.—Length of antennæ.....	0·060 inch	...	1·54 millimètres.
Expanse of wings.....	1·000 × 0·250	...	25·40 × 6·34
Size of body.....	0·850 × 0·290	...	21·58 × 7·35

Fulvous, opaque, variegated with black. Thorax with three short, broad, confluent black stripes, the anterior one not reaching the margin of the pronotum, two-thirds of its length in advance of the lateral ones; a large oblong black spot above the origin of the wings, immediately behind the suture; pleuræ black from behind fore coxæ, with a minute fulvous spot in the centre; pectus black; a large black marking in front of the halteres. Halteres fulvous, with the club and base black. Abdomen: first segment with a triangular black marking (based on the posterior margin), and a lateral black spot; second with a median stripe, widening posteriorly, and a roundish lateral spot posteriorly; third and fourth segments black, with two transverse fulvous markings posteriorly (indistinct on the fourth segment); remaining segments with a median black marking, the fifth and sixth with also lateral markings; all the segments with black markings beneath; the third to seventh black with small fulvous spots; genitalia fulvous. Fore coxæ fulvous; intermediate and hind pairs black. Femora black, fulvous at the base. Tibiæ with the anterior half and extreme base black; the posterior pair distinctly arcuated. Tarsi wholly black. Wings black at the base; posterior half and tip cinereo-fuscous, the anterior portion fulvous with two black spots; a large squarish spot (immediately before humeral cross-vein) between fifth longitudinal vein and costa, partially interrupted anteriorly in the costal cell; the second a narrow longitudinal stripe above the præfurca in the inner marginal cell; veins of same colour as that of the portion of the wing they traverse, except that the costa is black from the humeral cross-vein, and the cross-vein between the tip of the auxiliary vein and costa is slightly clouded with blackish. Second posterior cell with a petiole equal to half or more of its length; discal cell oblong, pentangular, a little shorter than fourth posterior cell, connected with fifth posterior cell by a very short vein a little before the middle of its length

(in reality the great cross-vein joining fourth longitudinal slightly beyond inner end of fourth posterior cell).

Hab.—Northern Australia (Damell) ; Fairy Bower, Manly, near Sydney (Mr. H. Prince), one specimen in November.

Obs. 1.—I have seen only two examples of this magnificent insect, both of which were captured at Manly.

Obs. 2.—In the specimen before me the anterior tibiae measure 7 lines, the tarsi 12 lines ; while the posterior tibiae are 9 lines and the tarsi 16 lines.

409. SEMNOTES IMPERATORIA, Westwood.

S. imperatoria, Westw., Trans. Ent. Soc. Lond. p. 502, pl. III. fig. 1, 1876.

♂.—Length of antennæ.....	—	inch	...	—	millimètres.		
Expanse of wings..... ..	1.090	×	0.220	...	27.67	×	5.58
Size of body.....	0.760	×	0.240	...	19.32	×	6.09
♀.—Length of antennæ.....	0.060	inch	...	1.54	millimètres.		
Expanse of wings... ..	1.220	×	0.320	...	30.98	×	8.12
Size of body.....	0.910	×	0.300	...	23.11	×	7.62

Stramineous-yellow, opaque, variegated with black. Antennæ black or brown (in one ♀ specimen the first joint of the scapus yellowish). Thorax smaller in ♂ than in ♀ ; the anterior portion black ; a transverse (usually large) black spot above the origin of the wings, immediately behind the suture ; suture black ; pleuræ (from behind fore coxæ) black, with a large triangular yellow spot beneath origin of wings ; pectus black ; each side of scutellum and the metathorax (except metanotum) black. Halteres black. Abdomen shorter and narrower in ♂ than in ♀ ; first five segments traversed by a broad black median stripe, the second to fourth with a narrow margin of black posteriorly which expands into a tolerably large spot laterally ; venter very similarly marked to the upper side, except that the median stripe is suddenly narrowed on the posterior half of the second segment. Fore coxæ

yellow; intermediate and hind pairs black. Femora black, yellow at the base. Tibiæ considerably longer in ♂ than in ♀, with the anterior half and the base black. Wings shorter and considerably narrower in ♂ than in ♀, black at the base; cinereo-fuscous (a paler brownish tint in old specimens), paler behind the humeral cross-vein; veins black or deep brown. Second posterior cell with a short petiole; discal cell oblong, pentangular, a little shorter than fourth posterior cell, in punctiform contact with fifth posterior cell.

Hab.—Melbourne, Victoria (Westwood); Sydney and Lane Cove, two ♀ specimens (Masters); Lawson, Blue Mountains, N.S.W., one ♂ specimen (Mr. H. Prince).

Obs. 1.—At first sight I took the above-mentioned ♂ specimen to belong to *Leptotarsus* on account of the extraordinary length of the tarsi; the anterior tibiæ are 8 lines and the tarsi 20 lines; the posterior tibiæ 9 lines and the tarsi 22 lines. In the ♀ the anterior tibiæ measure 8 lines and the tarsi 14 lines; the posterior tibiæ 9 lines and the tarsi 15 lines.

Obs. 2.—This species is easily distinguished from the last by its plain wings and different body-markings.

Genus 11. LEPTOTARSUS, Guérin.

Leptotarsus, Guérin, Voy. de la Coquille, Dipt. p. 286., 1838; O.Sacken, Studies I, p. 181, 1886.

First longitudinal vein joining the anterior branch of the second longitudinal near the base, *its tip, with the ultimate section of the branch, forming an arcuation*; præfurca as long or a little longer than the great cross-vein; second posterior cell petiolate. Front broad, slightly gibbose anteriorly. Rostrum short, about the length of the head, arched in front, with a distinct, obtuse nasus. *Antennæ 10-jointed, as long as or but little longer than the head. Palpi with the last joint long, flagelliform.* Genitalia in both sexes inconspicuous.

Rostrum short, arched in front, shorter than the head, much shorter in *L. trivittata*; nasus distinct, obtuse, pubescent; palpi with the first three joints sub-equal, the second more or less incrassated, the fourth joint long and flagelliform. Antennæ short, the length of the head or a little longer, the joints with minute hairs; 10-jointed in both sexes; first joint of the scapus cylindrical, about three times the length of the second; flagellar joints progressively diminishing in width from sub-globose to linear. Front broad, slightly gibbous anteriorly above the antennæ. Collare slightly prolonged into a neck. Thorax large and gibbous; suture distinct; abdomen less than twice the length of the thorax, narrow and compressed from the sides in the ♂; robust and clavate in the ♀, with the second segment truncate-conical, the third to fifth narrow, increasing in width, the rest narrow, diminishing; genitalia in both sexes inconspicuous. Legs very long and very slender, especially the hind pair; the tarsi more than twice the length of the tibiæ; tibia armed with a pair of short spurs; unguis small, hooked, smooth; empodia small, but distinct. Wings divaricate; shorter and narrower in ♂ than in the ♀; anal angle prominent in ♀, not so distinct in the ♂. Auxiliary vein reaching costa about opposite inner end of first submarginal cell; first longitudinal vein joining anterior branch of second longitudinal near its origin, forming an arcuation with the ultimate section of the branch; second posterior cell petiolate; discal cell longer than wide, pentangular, in punctiform contact with the fifth posterior cell at about the middle of its length.

410. *LEPTOTARSUS MACQUARTI*, Guérin. (Pl. v., fig. 15.)

L. Macquarti, Guérin, Voy. de la Coquille, Dipt. p. 286, pl. xx, fig. 1, 1838; *Tipula tricineta*, Walker, List Dipt. Brit. Mus. I, p. 73, 1848.

♂.—Length of antennæ.....	0.065 inch	...	1.66 millimètres.
Expanse of wings.....	0.940 × 0.180	...	23.86 × 4.56
Size of body.....	0.680 × 0.150	...	17.26 × 3.81

♀.—Length of antennæ.....	0·080 inch	...	2·02 millimètres.
Expanse of wings.....	1·150 × 0·250	...	29·21 × 6·34
Size of body.....	0·750 × 0·180	...	19·04 × 4·56

Stramineous-yellow. Flagellar joints of antennæ and last three joints of palpi usually brown, or growing obscure; antennæ as long as the head; first flagellar joint sub-globose, second ovate, third more elongate, the rest longer, linear; terminal joint usually short, sometimes as long as the preceding joint (Pl. vi., fig. 39, ♀ antennæ). Thorax shining black in front of suture (which colour extends back on each side to the base of the wings), with a yellow spot below the humeri; the rest yellow. Halteres with brown club. Abdomen with a black band on the hind borders of the first four segments; the band in the second segment usually carried slightly forward in the middle; the third and fourth usually with a complete median stripe connecting the bands; also sides of the two last-named segments black; the yellow portions of the segments, except anterior two-thirds of second, with a whitish bloom (especially in fresh specimens); fifth and following segments entirely yellow; venter with the hind border of second, and the third and fourth segments, usually shining black. Legs black, the coxæ and extreme base of femora yellow. Tarsi in fore and intermediate legs twice the length of tibiæ, in hind legs rather more than twice the length. Wings with a pale brownish tint, brown in the costal cell; stigma visible, but pale; veins dark brown, nearly black at base of wings.

Hab.—Sydney (Masters and Skuse). November. Nine specimens.

Obs. 1.—Walker's species, judging from the description, cannot be separated from *L. Macquarti*, Guérin.

Obs. 2.—In one specimen the discal cell is opened into the third posterior cell.

412. LEPTOTARSUS CLAVATA, Macquart.

Tipula clavata, Macq., Dipt. Exot. Suppl. IV. p. 14, pl. 1, fig. 4, 1850.

♂.—*Capite rufo. Thorace nigro-nitido. Abdomine clavato, rufo, fasciis nigris. Pedibus nigris, femoribus basi rufis. Alis fuscatis basi flavis maculaque fusca.*

Head fulvous-orange. Last joint of the palpi black. Antennæ rather short, naked, the first two joints fulvous; the rest black; the last seven small. Prothorax fulvous, narrow; mesothorax nitidous black; sides and lateral spot with fulvous bloom; another fulvous lateral spot near the posterior border; scutellum and metathorax fulvous, the last with two brown spots. Abdomen: the first two segments narrow, shining fulvous; second segment elongate, the posterior margin black; the five others forming an elongated mass; third and fourth black, with the anterior margin fulvous; fifth, sixth, and seventh fulvous; venter: the first two segments fulvous; the remainder shining black. Genitalia fulvous. Legs blackish-brown; femora with their anterior third fulvous, the anterior (pair) a little arcuated. Wings reddish-brown, with the exterior margin and stigmatic spot brown; base yellow as far as the base of the median cells. Length 7 × 1.

Hal. Tasmania

Head, rostrum, joints of scapus, and first joint of palpi fulvous ; the last three joints of palpi and flagellar joints black ; antennæ as long as the head ; first flagellar joint sub-globose, third to fourth ovate, progressively narrowing, the remaining four about equal in length to the next preceding one, sub-cylindrical, narrow. Thorax fulvous ; shining black in front of suture (which colour extends back on each side to the base of the wings), with a yellow spot below the humeri ; pectus shining black, covered with a hoary bloom at the sides ; metanotum with a black band or two black spots posteriorly. Halteres with brown club. Abdomen fulvous ; first segment margined posteriorly with black, the band produced anteriorly in the middle into a point, so as to make it triangular ; second segment shining, margined posteriorly with black, produced anteriorly in the middle into a dorsal stripe for not quite half the length of the segment ; third and fourth segments similarly margined with black, and with a complete median black stripe ; the third and following segments (also just above black band of second segment) covered with a greyish bloom ; venter usually with the posterior margin of the second, and the third and fourth segments, shining black. Legs brownish-black, the coxæ and basal portion of femora, or sometimes only the former, fulvous. Tarsi in all the legs more than twice the length of the tibiæ, in the hind legs twice and a half their length. Wings with a pale brownish tint, brown in the costal cell ; stigma visible, but rather pale ; veins dark brown, nearly black at the base of wings.

Hab.—Tasmania (Macquart) ; Mittagong, N.S.W. (Masters). Four specimens.

Obs.—Easily distinguished from *L. Macquarti* by the black pectus and black markings on posterior borders of metanotum, &c.

412. LEPTOTARSUS SCUTELLARIS, sp.n.

♂.—Length of antennæ..... 0·075 inch ... 1·89 millimètres.
 Expanse of wings..... 0·800 × 0·150 ... 20·32 × 3·81
 Size of body..... 0·540 × 0·120 ... 13·70 × 3·04

Head, including rostrum, suctorial labella and joints of scapus, reddish-fulvous; palpi black; flagellar joints of antennæ black; antennæ somewhat longer than the head; first flagellar joint short-obconical, second narrower, shorter, ovate, third and fourth progressively narrower, elongate-pyriform, the remaining four joints narrow, subcylindrical (Pl. vi., fig. 40). Collare reddish-fulvous. Thorax shining black; a yellowish pruinose spot below humeri, and a larger fulvous marking beneath on the pleuræ, between collare and origin of the wings; pleuræ and metathorax black, with a greyish bloom; scutellum reddish-fulvous. Halteres brownish with dusky club. Abdomen: first two segments shining fulvous, the second margined posteriorly with black (which is produced anteriorly in the middle for about half the length of the segment); third and fourth segments entirely shining black, with a greyish bloom; remaining segments and genitalia shining reddish-fulvous; venter as above. Legs entirely black (in one specimen the base of femora slightly fulvous). Tarsi in all legs more than twice and a-half the length of tibiæ, nearly three times their length in the hind pair. Wings with a pale brown tint, the costal cell and stigma darker; veins brown, the costa and first longitudinal vein dark brown, nearly black.

Hab.—Blue Mountains, N.S.W. (Masters). Two specimens.

Obs.—Readily distinguished from all other species by its almost entirely black thorax, black coxæ, and in having the first abdominal segment entirely fulvous, and the third and fourth segments black.

413. LEPTOTARSUS TRIVITTATA, sp.n.

♂.—Length of antennæ..... — inch ... — millimètres.

Expanse of wings..... 0·650 × 0·150 ... 16·51 × 3·81

Size of body 0·500 × 0·110 ... 12·70 × 2·79

♀.—Length of antennæ 0·065 inch ... 1·66 millimètres.

Expanse of wings..... 0·630 × 0·130 ... 16·00 × 3·30

Size of body..... 0·450 × 0·100 ... 11·43 × 2·54

Head fulvous, pruinose with greyish, tinged with blackish between the eyes; anterior portion of front, the rostrum and joints of scapus fulvous (more brownish in the ♀ specimen before me); rostrum rather more than half the length of the head; antennæ a little longer than the head; flagellar joints as in *L. scutellaris*. Collare brown, somewhat tinged with reddish-fulvous. Thorax fulvous (somewhat obscured by a greyish bloom), with three confluent deep brown or black, somewhat shining, stripes; intermediate stripe broad, extending from anterior margin $\frac{2}{3}$ the distance to suture; lateral ones narrower, extending from below humeri to origin of the wings; pectus brown covered with a greyish bloom; metanotum with a brown band posteriorly. Halteres fulvous with brown club. Abdomen: first segment fulvous, with a brown spot posteriorly; second shining fulvous, the posterior half black, with a large greyish hoary spot on each side; the remaining segments black, greyish hoary laterally; genitalia in both sexes slightly tinged with fulvous; venter similarly coloured to upper side. Legs dark brown or black, the coxæ somewhat tinged with fulvous. The tarsi (in ♀) in the fore and intermediate legs less than twice the length of tibiæ, twice their length in the hind pair. Wings blackish-brown at the origin, with a very pale brownish tint, exhibiting whitish reflections on the anterior half, the costal cell and stigma distinctly brown; veins dark brown, the costa and first longitudinal almost black.

Hab.—King George's Sound, West Australia (Masters). Two specimens.

Obs.—Differs from the rest in having three stripes on the thorax, and the third to last abdominal segments brown or black, &c. In the only ♂ specimen before me the antennæ and legs are lost.

b. Genitalia protruding in both sexes; ♂ forceps of rather simple structure.

Genus 12. ACRACANTHA, gen.nov.

First longitudinal vein joining anterior branch of second longitudinal near the base; præfurca distinctly longer than great

cross-vein; second posterior cell with a short petiole or sessile. Front tolerably broad, with a slight gibbosity above the base of antennæ. Rostrum shorter than the head, with a distinct hairy nasus. Antennæ 12-jointed in ♂, 14-jointed in ♀; short, with a certain number of terminal linear joints which are beset with bristly hair. Palpi with the last joint long, flagelliform. ♂ forceps of rather simple structure; valves of ♀ ovipositor straight and slender.

Rostrum half the length of the head; nasus prominent, hairy; palpi with the first three joints progressively increasing in length, the fourth as long as or longer than the preceding three taken together. Antennæ longer than the head and rostrum combined, very little longer in *A. monticola*, about the length in *A. inornata*; 12-jointed in ♂, 14-jointed in ♀; first five to seven flagellar joints diminishing in size, the remaining terminal joints linear, adorned with tolerably long stiff hairs; in *A. Sydneyensis* the first seven flagellar joints in ♂, and the first six in the ♀, give the antennæ a serrate appearance beneath; the first five in *A. monticola* less so (Pl. vi., fig. 42). Front tolerably broad, with a slight gibbosity above the antennæ in *A. Sydneyensis* and *A. monticola*, scarcely perceptible in *A. inornata*. Collare slightly prolonged into a neck. Thorax rather elongate; suture distinct. Abdomen slender and elongate; ♂ forceps not incrassate, of rather simple structure (Pl. vi., figs. 41, 41a); ♀ ovipositor with straight, slender valves. Legs long and slender; fore and intermediate tarsi twice the length of the tibiæ, in the hind legs less, on account of the greater length of the tibiæ; tibial spurs small (I cannot detect any on the fore tibiæ); unguis small, curved, dentate, smooth in *A. inornata* (♀); empodia very small, linear. The wings are considerably longer and broader in the ♀ than in the ♂; the anal angle is distinct. Anterior branch of second longitudinal vein oblique, the second longitudinal joining it near the origin; second submarginal cell longer than first posterior, their inner ends obliquely in line and forming almost a right angle with inner end of discal cell; the latter longer than broad, pentangular; second posterior cell long, with a short branch; sessile in *A. inornata*; fifth

posterior cell in punctiform contact with the discal (before the middle of its length); seventh longitudinal vein tolerably long, only slightly arcuated at the tip.

This genus may very likely be more closely related to *Habromastix* and *Phymatopsis* than to the genera with which it is perhaps arbitrarily classed at present.

414. *ACRACANTHA SYDNEYENSIS*, sp.n. (Pl. v., fig. 16.)

♂.—Length of antennæ.....	0·120 inch	...	3·04 millimètres.
Expanse of wings.....	0·500 × 0·120	...	12·70 × 3·04
Size of body.....	0·500 × 0·065	...	12·70 × 1·66
♀.—Length of antennæ.....	0·120 inch	...	3·04 millimètres.
Expanse of wings.....	0·690 × 0·170	...	17·51 × 4·31
Size of body.....	0·800 × 0·090	...	20·32 × 2·27

Head rich reddish-brown; the anterior portion of the front, face, rostrum and both joints of scapus reddish-fulvous; nasus, palpi and flagellar joints black; antennæ about twice the length of head; first joint of scapus rather long, cylindrical, about four times the length of second; in ♂ first seven, in ♀ first six, flagellar joints (viewed from the side) truncate-clavate, flattened above, produced beneath, (giving to the antennæ a distinctly serrate appearance), progressively diminishing in depth; the remaining joints (three in ♂, six in ♀) linear, beset with long bristly hairs. Collare bright pale yellow. Thorax brown, somewhat shining, with more or less distinct traces of paler longitudinal stripes; pleuræ with bright pale yellow stripe continuing from collare to base of halteres; scutellum and metanotum paler than the mesothorax. Halteres brown. Abdomen brown, the first two segments (in the ♂), margins of segments and venter, more or less fulvous-brown; genitalia fulvous or brownish-fulvous. Coxæ fulvous. Femora fulvous, growing brown towards the tip. Tibiæ and tarsi dark brown, the former fulvous at the extreme base. Tarsi in the fore and intermediate legs at least twice the length of tibiæ, in the

hind legs the tibiae longest and the tarsi less than twice their length. Wings with a delicate brownish tint, slightly darker in the costal cell; stigma pale; veins brown. Anterior branch of second longitudinal vein considerably shorter than petiole of first submarginal cell; second posterior cell with a rather short petiole; discal cell more elongate in ♀ than ♂, pentangular, its anterior border in direct line with petiole of second posterior cell; fifth posterior cell in punctiform contact with the discal.

Hab.—Sydney (Masters and Skuse). Three specimens.

415. *ACRACANTHA MONTICOLA*, sp.n.

♂.—Length of antennæ.....	0.100 inch	...	2.54 millimètres.
Expanse of wings.....	0.600 × 0.150	...	15.24 × 3.81
Size of body.....	0.600 × 0.070	...	15.24 × 1.77

Greatly resembling the preceding, *A. Sydneyensis*, as regards colouring; the differences are as follows:—First joint of scapus distinctly incrassated towards apex; second joint black; first flagellar joint obconical, the next four (viewed from the side) truncate-clavate, flattened above, of equal length, but progressively diminishing in depth; the remaining five terminal joints linear, beset with long bristly hair. Collare almost saffron-yellow. Thorax ochreous-brown, darker on the pronotum, somewhat shining; pleuræ ochreous, consequently the yellow stripe less prominent than in *A. Sydneyensis*. Halteres brown. Abdomen ochreous-brown, more or less infuscated towards the terminal segment; forceps ochreous. Coxæ ochreous. Femora black, growing ochreous towards the base. Genua pale. Tibiæ and tarsi black. Tarsi in fore and intermediate legs twice the length of the tibiae, in the hind legs less than twice their length. Wings with a pale brownish tint, darker in the costal cell; stigma indistinct; veins dark brown. Anterior branch of second longitudinal vein shorter than the petiole of first sub-marginal cell; second posterior cell with a very short petiole; discal cell rather elongate, pentangular, its anterior border a little arcuated, in punctiform contact with fifth posterior cell.

Hab.—Wentworth Falls, Blue Mountains (Skuse). In damp caves in January. A single specimen.

Obs.—Differs from *A. Sydneyensis* chiefly in the structure of antennæ (having five terminal linear joints in ♂), the less distinct stripe on the pleuræ, and arcuated anterior border of discal cell.

416. *ACRACANTHA INORNATA*, sp.n.

♀.—Length of antennæ.....	0·100 inch	...	2·54 millimètres.
Expanse of wings.....	0·720 × 0·180	...	18·28 × 4·56
Size of body.....	0·850 × 0·090	...	21·58 × 2·27

Brownish-fulvous or brownish-ochreous. Front with a small deep brown spot on each side next the eyes, also a small one at base of rostrum; palpi and flagellar joints black; first joint of scapus short, twice the length of the second; first flagellar joint almost obconical, the next three more elliptical, progressively diminishing in thickness, fifth cylindrical, slender, the following seven linear, beset with long stiff hairs. Thorax somewhat shining, with faint indications of three brownish lines; suture brownish; scutellum and metanotum paler than the mesothorax. Halteres ochreous, the club slightly infuscated. Abdomen somewhat shining, slightly infuscated with brownish from second segment; ovipositor almost fulvous, the valves straight and slender, longer than in *A. Sydneyensis*. Coxæ and femora ochreous or fulvous, the tip of the latter brown. Genua pale. Tibiæ and tarsi deep brown or black. Tarsi twice the length of the tibiæ (the hind legs wanting in the specimen before me). Wings with a pale brownish tint, the costal cell and stigma more ochreous; veins brown. Anterior branch of the second longitudinal vein equal in length to petiole of first submarginal cell; second posterior cell sessile, in punctiform contact with the discal; the latter rather elongate, pentangular; fifth posterior cell in punctiform contact with the discal.

Hab.—King George's Sound, Western Australia (Masters). A single specimen in Coll. Australian Museum.

Obs.—Distinguished by the absence of yellow stripe on the pleuræ, the uniformly coloured collare, structure of antennæ, sessile second posterior cell, &c.

2. *Antennæ usually short, sometimes very long, normally 13-jointed, sometimes more, in both sexes.*

a. *Genitalia protruding in both sexes.*

* *Antennæ serrate.*

Genus 13. *ISCHNOTOMA*, gen.nov.

First longitudinal vein incurved into the anterior branch of second longitudinal near the base; præfurca short, but longer than great cross-vein; ultimate section of second longitudinal vein arcuate, as in *Holorusia*; second posterior cell petiolate. Eyes rather large. Front moderately broad, with a distinct tubercle anteriorly, above the base of antennæ. Rostrum more or less the length of the head, with a distinct, pointed nasus. Antennæ short, serrate, the length of head and rostrum taken together; 13-jointed; first joint of scapus and first flagellar joint long. Genitalia of ♂ short, not incrassate, of rather simple structure; ♀ ovipositor with rather short valves.

Rostrum very minutely pubescent, as long as the head in *I. serricornis* and *I. par*, shorter in *I. rubriventris*; the nasus very prominent. Palpi long, the first three joints progressively increasing in length, the fourth flagelliform. Collare slightly prolonged into a short neck. Antennæ with the first flagellar joint long, cylindrical; the following eight or nine progressively diminishing in length and more or less distinctly produced beneath, very distinctly in *I. serricornis* and *I. par* (Pl. VI., fig. 46); last two terminal joints small; the joints only microscopically pubescent. Eyes ovate, almost contiguous beneath (not so close in *I. rubriventris*). Front with a fulvous tubercle anteriorly. Thorax elongate-ovate, convex; transverse suture distinct; scutellum small; metanotum convex. Abdomen long, slender, cylindrical, glabrous, or with only a very minute pubescence; ♂ forceps short, not wider than the preceding

abdominal segment, of rather simple structure (Pl. vi., figs. 43-45); ♀ ovipositor with short slender valves, the upper ones longer than the lower and blunt at the tip. Legs long and slender; fore and intermediate tibiae with a single small spur, hind tibiae provided with a pair; tarsi very slender, much longer than the tibiae; unguis distinct, toothed in *I. par* (♂); empodia small, narrow. Wings lanceolate, with a distinct anal angle. Auxiliary vein joining first longitudinal vein about opposite middle of præfurca; ultimate section of second longitudinal vein more strongly arcuated in *I. serricornis* than in the other species; petiole of second posterior cell about half the length of the cell; discal cell pentangular, in punctiform contact with fifth posterior cell at about $\frac{1}{3}$ of its length, more elongate in *I. par* and *I. rubriventris* than in *I. serricornis*.

The three species here included form a compact group, and may be at once recognized by the structure of the flagellar joints of the antennæ, arcuated ultimate section of the second longitudinal vein, yellow tubercle on the front, and structure of the ♂ genitalia.

417. *ISCHNOTOMA SERRICORNIS*, Macquart. (Pl. v., fig. 17.)

Tipula serricornis (♂), Macq., Dipt. Exot. Suppl. I. p. 13, pl. 1, fig. 7, 1846; *T. eburnea* (♀), Walker, List Dipt. Brit. Mus. I. p. 69, 1848; *T. albovariegata* (♂), Macq., Dipt. Exot. Suppl. V. p. 16, pl. 1, fig. 3, 1855.

♂.—Length of antennæ.....	0·120 inch	...	3·04 millimètres.
Expanse of wings.....	0·850 × 0·180	...	21·58 × 4·56
Size of body.....	0·650 × 0·120	...	16·51 × 3·04
♀.—Length of antennæ.....	0·120 inch	...	3·04 millimètres.
Expanse of wings.....	0·950 × 0·220	...	24·12 × 5·58
Size of body....	0·880 × 0·135	...	22·34 × 3·42

Head brown or greyish-brown, the frontal tubercle fulvous-yellow; rostrum brown; suctorial labella, palpi, and antennæ black or deep brown (in one ♂ specimen the flagellar joints fulvous-brown); first joint of the scapus about $\frac{1}{3}$ longer, and thicker than the first flagellar joint; second more than half the

length of the first, subcylindrical, slightly produced beneath; third to ninth progressively decreasing in size, obtrigonal, with a very short pedicel anteriorly; penultimate joint slender, the terminal one small. Collare usually more or less mottled with whitish. Thorax brown; a broad irregular whitish or yellowish band laterally, from before humeri to suture; a dark brown median line usually distinctly traversing the thorax, with a small yellowish spot on each side at the pronotum and a rather large one, followed by a short indistinct stripe on each side, before the suture; behind the suture a broad white band extends to and includes the scutellum; three white or yellowish spots on each side, two against the suture and the third above the origin of the wings; pleurae with a large white spot beneath the wings and a small one between the origin of the wings and the fore coxae; metanotum with two white spots. Halteres fulvous, the club black. Abdomen brownish-fulvous; first segment white at the sides; venter with the segments white at the sides. Coxae white; trochanters dark brown. Femora and tibiae brownish-fulvous, dark brown at the tips. Tarsi brown. Wings whitish, much marbled with brown and greyish; a roundish clear spot in anal angle, a larger spot at tip of seventh longitudinal vein, another just before tip of sixth longitudinal vein, others at tip of second longitudinal vein, centre of discal cell, basal half of first and whole of second posterior cell; several more or less conspicuous ones; veins brown; stigma inconspicuous.

Hab.—Tasmania; South Australia; and Sydney, N.S.W. (Masters). Eight specimens for comparison.

Obs.—This insect has been characterised under three different specific names from specimens obtained in Tasmania, and Adelaide, South Australia.

418. *ISCHNOTOMA PAR*, Walker. (Pl. v., fig. 18.)

Ptilogyna par, Wlk., Ins. Saund. Dipt. p. 446, 1856.

♂.—Length of antennæ.....	0·120 inch	...	3·04 millimètres.
Expanse of wings.....	0·750 × 0·150	...	19·05 × 3·81
Size of body.....	0·680 × 0·100	...	17·26 × 2·54

♀.—Length of antennæ.....	0·120 inch	...	3·04 millimètres.
Expanse of wings.....	0·880 × 0·200	...	22·34 × 5·08
Size of body.....	0·850 × 0·110	...	21·58 × 2·79

Head grey, with a longitudinal brown stripe on the front; a prominent fulvous tubercle anteriorly (above the antennæ); face and rostrum, and usually (though often obscurely) the second joint of the scapus and first flagellar joint fulvous; suctorial labella, palpi and the remaining joints of antennæ brown or black; first joint of scapus about $\frac{1}{3}$ longer, and thicker, than first flagellar joint; second to tenth flagellar joints (viewed from the side) serrate beneath (most strongly in ♂), each really produced from the base (less strongly in the ♀) into an almost disciform process which is thickest at its attachment (in the ♀ the second and third joints only nodose beneath); each joint with a very short pedicel anteriorly; terminal joint slender. Thorax with four slate-coloured, black-bordered stripes, the intermediate pair contiguous; the lateral ones short; the intervening spaces, humeri and lateral borders yellowish; from suture to metanotum whitish, with a median black line, the lateral borders black; and two contiguous slate-colored, black-bordered spots on each side above the origin of the wings; pleuræ more or less pruinose with white; pectus brown. Halteres testaceous, with brown or blackish club. Abdomen fulvous; first segment brownish to black, more or less hoary; the following segments bordered posteriorly with black, and laterally with white; genitalia fulvous. Coxæ hoary; trochanters brown or black. Remaining joints black (in fresh specimens) or brown, fulvous towards base of femora. Wings greyish with whitish streaks (mostly on the apical half), the costal, marginal and submarginal cells more or less clouded with brownish, with a whitish mark at each end of stigma; veins black, the auxiliary vein and origin of wings testaceous or fulvous; the great cross-vein and fifth and seventh longitudinal veins clouded with fuscous.

Hab.—Sydney (Masters), two specimens; near Armidale, N.S.W. (Mr. J. F. Schofield); Moonbar and Jindabyne, N.S.W.,

3-3,500 ft., (Helms), *several specimens in Coll. Australian Museum*.
March.

Obs.—With the assistance of Baron Osten-Sacken's note (Studies I, p. 176) on this species I cannot help concluding that the above-described is Walker's *Ptilogyna par*.

419. *ISCHNOTOMA RUBRIVENTRIS*, Macquart. (Pl. v., fig. 19.)

Tipula rubriventris, Macq., Dipt. Exot. Suppl. I., p. 14, pl. 1, fig. 9, 1846.

♂.—Length of antennæ.....	0·100 inch	...	2·54 millimètres.
Expanse of wings.....	0·720 × 0·150	...	18·28 × 3·81
Size of body.....	0·600 × 0·080	...	15·24 × 2·02
♀.—Length of antennæ.....	0·100 inch	...	2·54 millimètres.
Expanse of wings.....	0·720 × 0·170	...	18·28 × 4·31
Size of body.....	0·640 × 0·090	...	16·25 × 2·27

Head slate-grey, with a dark median stripe on the front ; frontal tubercle bright fulvous ; rostrum black, fulvous at the sides ; suctorial labella, palpi and antennæ black ; first joint of scapus scarcely $\frac{1}{2}$ longer, but thicker, than first flagellar joint ; second to ninth flagellar joints rounded beneath, progressively diminishing in length ; terminal two joints small. Collare dull fulvous with a brown spot. Thorax hoary grey, almost completely covered by three confluent black stripes ; the intermediate stripe cuneiformly narrowed to the suture, its margins and a median line of deeper black, also two short slate-grey lateral stripes posteriorly ; lateral stripes short, connected with the intermediate one at about the middle of its length ; the humeral pits, transverse suture, a large spot above origin of wings (behind suture), and the sides and posterior borders of scutellum and metanotum, black ; also a more or less distinct black median line from suture, across scutellum and metanotum. Halteres fulvous, the club brown or black. Abdomen fulvous, levigate, with a black band on the posterior margin of second to seventh segment ; yellowish-grey laterally ; genitalia

brownish-fulvous. Coxæ hoary grey; the trochanters black. Remaining joints black, except the base of femora fulvous. Wings with a very pale brownish tint, exhibiting whitish reflections when viewed at a certain obliquity; veins dark brown, fulvous at origin of wing, slightly infuscated; stigma brownish.

Hab.—Tasmania (Macquart); Berrima and Piper's Flats, near Sydney (Masters); London Bridge, near Tenterfield, New England, N.S.W. (Skuse), four males and one female; Moonbar, Monaro, and Jindabyne, N.S.W., 3-3500 feet (Helms); *specimens in Coll. Australian Museum.*

Obs.—Macquart's figure of the antennæ is fairly good, but it does not show the last two small joints.

**** *Antennæ simple.***

Genus 14. *HOLORUSIA, Loew.**

Holorusia, Loew, Berl. Entom. Zeits. VII., p. 277, 1863; O.-Sacken, Studies I., p. 183, 1886.

The ultimate section of the second vein very arcuate, so that, in the middle of its course it closely approaches the third, again rising towards the costa. The cross-vein connecting the first with the second vein is obsolete, so that the inner marginal cell coalesces with the outer one; joints of the antennæ short, provided with only very minute bristles; the rest as in *Tipula*.

The above is a translation of the definition of this genus as drawn up by Loew. The species now described (from ♂ examples) exhibits the following structural characters. Rostrum as long as the head, microscopically pubescent; nasus distinct. Palpi with the second joint longer than the first or third, slightly thickened towards the apex; fourth joint long, flagelliform. Antennæ

* Dr. Bergroth (Entom. Tidskr., 1888, p. 140) is of opinion that *Holorusia* cannot be maintained as a genus distinct from *Tipula*. On the other hand, Baron Osten-Sacken (Studies I., p. 183) points out that "the true extent and better definition of the genera *Stygeropsis*, *Longurio*, and *Holorusia* will be obtained only through a general revision of the now very numerous species of *Tipula*, European and exotic."

about the length of the head and rostrum taken together; first joint of the scapus obconical, the second narrower, cyathiform; flagellar joints progressively diminishing in length, beset with short hairs, the first joint cylindrical, the second to ninth more convex beneath; penultimate joint narrower; terminal joint minute. Eyes rather approximate beneath. Front flattened, with a slight gibbosity anteriorly (above the base of the antennæ). Collare slightly prolonged into a neck. Thorax elongate-ovate; metanotum abruptly angled posteriorly. Abdomen slender, cylindrical, clothed with a microscopic pubescence; ♂ genitalia not incrassate, the lamella terminalis supera deeply emarginate. Legs very long and slender; fore and intermediate tibiæ with a single short spur, hind pair with two; tarsi very slender, more than twice the length of tibiæ; last joint of tarsi nodose at base; ungues tolerably strong, arcuated, bidentate beneath (Pl. VI., fig. 47); empodia minute. Wings lanceolate, longer than entire body; anal angle distinct, but rounded. Auxiliary vein reaching first longitudinal opposite inner end of second submarginal cell; first longitudinal vein joining second a little before origin of anterior branch;* ultimate section of second longitudinal considerably arcuated; inner end of second submarginal cell a little before that of first posterior, but beyond that of discal cell; second posterior cell with a moderately long petiole; discal cell pentangular, longer than broad, in more than punctiform contact with fifth posterior cell immediately before the middle of its length.

These insects also occur in N. America, Africa, India and Java.

420. *HOLORUSIA CONSPICABILIS*, sp.n.

♂.—Length of antennæ.....	0·120 inch	...	3·04 millimètres
Expanse of wings.....	1·000 × 0·200	...	25·40 × 5·08
Size of body.....	0·850 × 0·130	...	21·58 × 3·30

* The tip of the first longitudinal vein (spoken of as "the cross-vein" by Loew) is not obsolete in *H. conspicabilis*, but clearly reaches the second longitudinal. It is evident that this author regarded the cross-vein between the costa and first longitudinal vein as being the tip of the latter.

Brown, opaque. Front, upper side of rostrum and second joint of scapus yellowish. Thorax margined anteriorly with a sericeous yellow line; traversed by three more or less distinct yellowish lines; intermediate one extending from pronotum to suture; lateral ones sinuose, sometimes interrupted behind humeri, starting immediately below pronotum; deep brown between the last stripes and lateral margin; pleuræ sordid ochreous, with a longitudinal brown or brownish stripe from collare to base of halteres; pectus with brown markings. Abdomen: the segments with the posterior and lateral margins paler; ♂ genitalia with yellow appendages. Legs brownish-yellow, the femora with a broad ring of black or deep brown at the tip. Wings with a pale brownish tint; the costal cell and stigma rather darker; the tip of wing and (especially) the transverse fold with a pale reflection; veins brown, the fifth longitudinal vein and great cross-vein clouded at their juncture.

Hab.—Mulgrave River, Northern Queensland (Froggatt); Buderim Mountains, Queensland (C. J. Wild), *one specimen in Coll. Queensland Museum.* December.

Obs.—I have seen only three specimens of this elegant Tipulid.

421. HOLORUSIA LATERALIS, Walker.

Tipula lateralis, Walker, List Dipt. Brit. Mus. I., p. 70, 1848.

"Ferruginea, flavo varia, thorace fusco trivittato, abdomine fusco, antennis ferrugineis, pedibus fuscis, femoribus basi tibiisque apice fulvis, alis subfuscis vittis nonnullis ferè obsoletis limpidis, margine antico fulvo."

"Head yellow; its crown ferruginous: mouth ferruginous: palpi black: feelers ferruginous: chest ferruginous, with three light brown lines along its back; fore border and sides bright pale yellow, inclining to white: abdomen brown: legs brown; tips of shanks, and thighs from base to beyond middle, tawny: wings slightly brown, with a few indistinct narrow colourless longitudinal lines; fore borders tawny; veins brown: poisers tawny,

with pale brown tips. Length of the body 10 lines; of the wings 20 lines."

Hab.—N.W. coast of Australia. *Specimen in Coll. British Museum.*

Obs.—Evidently belonging to *Holorusia*, and perhaps closely allied to the last. The species is totally unknown to me. I have not seen any Tipulidæ from N. W. Australia.

Genus 15. TIPULA, Linnæus.

Tipula, Linn., Fauna Suec. 1740; Fabricius, Ent. Syst. IV., 1794; Latreille, Crus. et Ina. IV., p. 255, 1809; Meigen, Syst. Besch. I., p. 168, 1818; Macquart, S. à B. Dipt. I., p. 80, 1834; Curtis, Brit. Entom. XI., p. 493; Macquart, Dipt. Exot. I., p. 52, 1838; Zetterstedt, F. Lapp. 1840; Dipt. Scand. X., 1851; Walker, Ins. Brit. Dipt. III., p. 318, 1856; Schiner, F.A., 1864; Loew, Besch. Europ. Dipt. III., 1873; V. d. Wulp. Dipt. Neerl. 1877; Westhoff, Ueber den Bau des Hypopygiums der Gatt. *Tipula*, 1882.

Probably none of the following species, described under the generic name *Tipula*, will eventually be found to belong to this genus *sensu stricto*.

422. TIPULA SENEX, White.

T. senex, White, Voy. Erebus and Terror, Insecta, p. 27, pl. VII. fig. 15; Walker, List Dipt. Brit. Mus. I. p. 71, 1848.

"Head pale cinereous, with basal fourth and a central oval depression testaceous; prothorax testaceous, with central longitudinal ridge, two lateral cinereous bands; mesothorax and metathorax cinereous, with central and lateral longitudinal dusky bands. Abdomen fulvous; indications of dusky bands of metathorax continued into basal segments. Wings hyaline white; costa to mediastinal vein stramineous; veins testaceous; costa, a spot at first third of discoidal cell, two obliquely just beyond second,

third, a fourth near apex, and a nebulous striole at apex of cell brown. Poisers pale testaceous; legs testaceous; pectus pinkish-cinereous, with several dusky spots. Expanse 2 inches."

Hab.—New Zealand and N. S. Wales (Dr. Sinclair). *Specimens in Coll. British Museum.*

Obs.—The species is unknown to me; the locality N.S.W. is given only on the authority of Walker.

423. *TIPULA RUFIVENTRIS*, Macquart.

T. rufiventris, Macq., *Dipt.-Exot. Suppl. I.* p. 13, pl. 1, fig. 8, 1846.

"♀.—*Thorace griseo, vittis quatuor fuscis. Abdomine rufo, apice fuscato. Antennis brevibus, nudis, nigris, basi flavis.*"

Head grey; sides of rostrum fulvous; proboscis and palpi black. Front brownish with grey sides. Antennæ black, without hairs, rather short; first joint yellow; the third, fourth, fifth, sixth, and seventh of equal length, and almost cylindrical; the remainder shorter and more slender. Thorax with four blackish stripes before the suture; a yellowish stripe before the origin of the wings; pleuræ grey; metathorax grey, with a black triangular spot. Abdomen dull fulvous; the last three segments brownish, with whitish incisions; ovipositor fulvous. Legs blackish; base of femora yellow. Wings rather clear; veins slightly bordered with brownish; stigma brownish. Length 6 × 1 lines.

Hab.—Tasmania.

Obs.—In a foot-note attached to the description of this species the author suggests that it might be the ♀ of *T. rubriventris*, Macq., of which he only described the ♂, and he seems to attach some importance to a slight difference between them in the length of the petiole of the second posterior cell. But the petiole often varies in individuals. However, this insect appears otherwise quite a distinct species; for instance, the antennæ are serrate beneath in both sexes of *T. rubriventris*. Unfortunately I have seen no specimens which will answer to the above description.

424. *TIPULA NIGRICAUDATA*, Macquart.

T. nigricaudata, Macq. Dipt. Exot. Suppl. V. p. 16, p. 1, fig. 2, 1855.

"♂ and ♀.—*Thorace flavido, vittis fuscis. Abdomine ferrugineo, apice nigro. Antennis fuscis, basi rufis. Pedibus fuscis, femoribus basi rufis. Alis subhyalinis, cellula mediastina fusca.*"

Proboscis and palpi obscure; rostrum of ordinary length, fulvous, of a greyish-black above. Front greyish-black, with the sides more clear. Antennæ: the first joints fulvous; the others black, cylindrical. Thorax greyish-yellow, pale, with four black stripes; the two lateral ones shorter than the intermediate; scutellum grey. Abdomen ferruginous; fifth, sixth, and seventh segments blackish; ♂ genitalia a little dilated; ovipositor ferruginous, with the extremity obscure. Legs blackish-brown; femora with the basal half fulvous. Halteres fulvous, with obscure club. Wings hyaline; veins slightly bordered with pale brownish; mediastinal cell brown. Length 6 x 1 lines.

Hab.—Adelaide (M. Bigot).

Obs.—The above description differs so little from that of *T. rufiventris*, that I feel almost warranted in assuming that they both have reference to the same species.

Genus 16. *PACHYRRHINA*, Macquart.

Pachyrrhina, Macq., S. & B. Dipt. I., p. 88, 1834; Dipt. Exot. I., p. 48, 1838; O.-Sacken, Studies I., p. 184, 1886.

First longitudinal vein joining anterior branch of second longitudinal near the base; præfurca as long as or shorter than great cross-vein; second posterior cell sessile; discal cell (if always) separated from fifth posterior by a very short vein. Front convex, or gibbous anteriorly. Rostrum short and thick; nasus distinct, acute. Antennæ normally 13-jointed, sometimes more; in ♂ usually about the length of or longer than thorax, shorter than it in ♀: flagellar joints beset with short stiff hairs at the base. ♂ genitalia rather incrassate, of complicated structure; ♀ ovipositor with

The species now described exhibits the following structural characters. Rostrum half the length of the head; nasus pointed, haired. Palpi with the second and third joints about equal in length, considerably longer than the first; fourth longer than preceding three combined, slender, flagelliform. Antennæ in ♂ as long as the head and thorax combined, in ♀ about twice the length of the head; first joint of scapus not very long, shorter than first flagellar joint, obconical; second very short, narrower than the first, cyathiform; flagellar joints subcylindrical, just perceptibly nodose at the base, progressively diminishing in length and thickness, the second to tenth beset with a few short stiff hairs at the base; the terminal joint minute. Front tolerably broad, gibbose anteriorly. Collare only slightly prolonged. Thorax elongate-ovate, convex; scutellum and metanotum convex. Abdomen long, cylindrical; ♂ genitalia incrassate; valves of ♀ ovipositor straight. Legs long and slender; fore and intermediate tibiæ with a single short spur, hind pair with two short spurs; tarsi very slender, considerably longer than the tibiæ; ungues minute, smooth in both sexes; empodia present. Wings lanceolate, divaricate; anal angle distinct but not prominent. Auxiliary vein running close to the first longitudinal vein, with a short tooth of a vein at its tip; ultimate section of the anterior branch of second longitudinal vein almost appearing as a continuation of the first longitudinal; præfurca very short, obliquely situated, considerably less than half the length of great cross-vein; second posterior cell long, usually in not more than punctiform contact with discal cell; discal cell very small, rhomboidal, separated (at its inner end) from fifth posterior cell by a very short vein.

This genus is of universal distribution. The body-colouring of the contained insects is usually some shade of yellow, banded and striped with black. Some species (European and American) possess 19-jointed antennæ in ♂, 15-jointed in ♀; whilst the N. American *P. polymera*, Loew, has 16-jointed antennæ in ♂ and 14-jointed in ♀.

425. *PACHYRRHINA AUSTRALASIE*, sp.n. (Pl. v., fig. 20.)

- ♂.—Length of antennæ..... 0·210 inch ... 5·33 millimètres.
 Expanse of wings..... 0·450 × 0·100 ... 11·43 × 2·54
 Size of body..... 0·480 × 0·060 ... 12·18 × 1·54
- ♀.—Length of antennæ..... 0·130 inch ... 3·30 millimètres.
 Expanse of wings..... 0·500 × 0·120 ... 12·70 × 3·04
 Size of body..... 0·640 × 0·070 ... 16·25 × 1·77

Fulvous, the head and thorax usually paler yellow. *Nasus* brownish. Flagellar joints of antennæ brown or black. Thorax with three prominent shining black stripes; intermediate broader at the pronotum, extending to the suture; lateral ones from humeri to scutellum, interrupted at suture. Halteres yellow. Abdomen: first five segments banded posteriorly with black; sixth and seventh entirely black; genitalia brownish-fulvous. Coxæ and femora fulvous, the tips of the latter deepening into dark brown or black. Tibiæ brownish or dusky-fulvous, the tips dark brown or black. Tarsi dark brown or black. Wings pellucid, with a greyish tint; beautifully iridescent; veins deep brown or black; stigma fuscous, distinct. Venation as in the preceding enumeration of structural characters.

Hab.—Barron and Mulgrave Rivers, N. Queensland (Froggatt); Nerang, Queensland (C. J. Wild), *one specimen in Coll. Queensland Museum*; Lord Howe Island, N.S.W. (Saunders). April to July. Fifteen specimens.

b. Genitalia inconspicuous in both sexes.

Genus 17. *MACROMASTIX*, Osten-Sacken.

Tipula, Swederus, Act. Holm. 1787, p. 286; *Megistocera*, Westw., Zool. Journ. V. p. 451, 1830; *Macrothorax* (*præoc.*), Jænnicke, Abh. Senck. Natur. Ges. Frank. VI. p. 319, 1867; *Macromastix*, Osten-Sacken, Studies on Tipulidæ, I. p. 185, 1886.

First longitudinal vein joining anterior branch of second longitudinal vein near the base; præfurca usually longer than great

cross-vein; second posterior cell petiolate; proximal end of stigma thickened. Front broad, with a tubercle anteriorly. Rostrum as long as the head; nasus distinct. Antennæ 13-jointed in both sexes; ♂ antennæ sometimes very long and filiform, often short as in the ♀ (about the length of, or even a little longer than, the head and rostrum combined). Genitalia inconspicuous in both sexes.

Rostrum the length of the head; in *M. constricta* (Pl. VI., fig. 51) distinctly constricted just before the middle of its length (viewed from above); clothed with minute pubescence; nasus distinct, haired. Palpi with the first and third joints about equal in length, the second slightly longer, fourth joint about the length of preceding taken together. The antennæ are 13-jointed, short in both sexes, or the ♂ antennæ very long (of extraordinary length in *M. costalis* and the South American *M. chilensis*, Phil.). The great length of the ♂ antennæ in some species has hitherto been regarded as a generic character, but it is now found that, as with *Megistocera*, Wied., and some other genera, there are species in which both ♂ and ♀ possess short antennæ. In the ♂ of *M. costalis* the antennæ are about three times the length of a wing; the first joint of the scapus incrassate, almost fusiform, the second short annular; first nine flagellar joints almost filiform, progressively increasing in length and diminishing in thickness; the terminal two joints very minute (particularly the last one); the flagellum is clothed on the inner side with a microscopic dense pubescence, amongst which, at regular intervals, are minute spine-like bristles. Baron Osten-Sacken says that the microscopic pubescence exists on the under-side of the flagellum; however, it is distinctly on the inner side in *M. costalis*, and only visible viewed from above or beneath. The ♂ antennæ of *M. Helmsi* are almost the length of a wing; the first joint of scapus much smaller than in *M. costalis*; the flagellar joints of similar structure to those of the last-named, but with dense microscopic pubescence both beneath and on the inner side, a more sparse pubescence above and on the outer side, and without the spine-like bristles (as in the New Zealand *M. vulpina*,

Hutton). In the ♀ of *M. costalis* and *M. Helmsi*, and in both sexes of the remaining four species now described, the antennæ are short, about the length of, or a little longer than the head and thorax taken together; the first joint of the scapus obconical, not unusually long or thick; second joint small, short, cyathiform; flagellar joints diminishing in length and thickness, beset with minute hairs; the first four or five joints elliptical, or sub-cylindrical attenuate at the base; the remaining six or seven joints more or less linear, sometimes the last one (or even two) minute (evidently subject to modification). Front broad, with a tubercle or gibbosity anteriorly, which is more distinct in the ♂ than in the ♀; in the ♂ of *M. costalis* the tubercle is very large and hairy (Pl. VI., fig. 48); whilst in both sexes of *M. humilis* it is reduced to a scarcely perceptible gibbosity. Thorax elongate-ovate, gibbose (densely haired in the ♂ of *M. costalis*); metanotum convex; transverse suture distinct. Abdomen short, not more than about twice the length of the thorax; in ♂ cylindrical; in ♀ more stout; the genitalia in both sexes inconspicuous, narrow, only a little protruding (Pl. VI., fig. 50, ♂ genitalia of *M. costalis*); two very small valvules are visible in the terminal segment of the ♀. Legs long and slender; fore tibiæ with a single small spur, the intermediate and hind tibiæ each with a pair; tarsi considerably (especially the hind pair) longer than the tibiæ; unguis small; empodia present. Wings lanceolate; anal angle usually inconspicuous, tolerably distinct in the ♂ of *M. costalis*. Auxiliary vein terminating in first longitudinal vein at inner end of stigma; the inner end of stigma thickened (figured as a vein by Westwood and Jænnicke); first longitudinal vein joining anterior branch of second longitudinal vein near the base; the latter branch not very obliquely situated; rhomboid cell small; præfurca usually longer than great cross-vein, in direct line with remainder of the second longitudinal; inner end of second submarginal and first posterior cells obliquely in line; second posterior cell petiolate; discal cell elongate, pentangular, usually in punctiform contact (at about $\frac{1}{3}$ of its length) with fifth posterior cell; seventh longitudinal vein usually short and running close to the margin, the most distant from it in *M. costalis*.

The insects included in this genus may be at once distinguished by their small abdomen, and inconspicuous nature of the ♂ holding forceps and ♀ ovipositor. Their colour is usually dull and the wings have a more or less distinct brown border anteriorly.

These flies are commonly found among grass and low herbage and may be known by their peculiar darting flight.

The New Zealand species has been described by Prof. Hutton (Cat. N. Zeal. Dipt. p. 16, 1881); whilst *Megistocera chilensis*, Phil. (V. z-b. G. Wien, p. 617, 1865), described from S. America, is, Baron Osten-Sacken informs me, a true *Macromastix*. In both the ♂ possesses long antennæ. Besides these and the following no others have been described.

Table for determining the species.

- I. ♂ antennæ about three times the length
of a wing.... *costalis*, Swed.
- II. ♂ antennæ about the length of a wing... *Helmsi*, sp.n.
- III. ♂ and ♀ antennæ short.
 - a. Rostrum distinctly constricted before the middle *constricta* sp.n.
 - b. Rostrum almost straight.
 - * Wings conspicuously bordered anteriorly with brown, followed by a narrow almost hyaline streak *Mastersi*, sp.n.
 - ** Wings bordered anteriorly with brown, paler than the stigma *obscurirostris*, sp.n.
 - *** Wings deeply clouded in costal cell only; the veins slightly clouded..... *humilis*, sp.n.

I. ♂ antennæ about three times the length of a wing.

426. MACROMASTIX COSTALIS, Swederus. (Pl. v., fig. 21.)

Tipula costalis, Swederus, Act. Hom. 1787 p. 286; *Megistocera dimidiata*, Westwood, Zool. Journ. V. p. 451, 1830; Ann. Soc. Ent. Fr. IV, p. 682, 1835; Trans. Ent. Soc. Lond. 1881, p. 378, pl. xviii. fig. 9; *M. dispar*, Walker, Ent. Mag II, p. 468, 1835; Schiner, Dipt. "Novara" Exp. 1868, p. 39; *M. limbipennis*, Macquart, Dipt. Exot. I, p. 60, pl. vi. fig. 1, 1838; Suppl. 1, p. 17, pl. II, fig. 3, 1846; Suppl. IV, p. 16, 1850; *M. pacifica*, Erichson, Archiv fur Natur. VIII, Bd. I, p. 270, 1842; *Macrothorax ornatus*, Jænnicke, Abh. Senck. Natur. Ges. Frank. VI. p. 320, pl. 43, fig. 2, 1867.

♂.—Length of antennæ..	2.000 inch *	5080 millimètres.
Expanse of wings.....	0.700 × 0.160	17.78 × 4.06
Size of body.....	0.460 × 0.120	11.70 × 3.04
♀.—Length of antennæ.....	0.090 inch	2.27 millimètres.
Expanse of wings.....	0.700 × 0.160	17.78 × 4.06
Size of body.....	0.500 × 0.090	12.70 × 2.27

Ochreous or brownish ochreous. Head sometimes with two small indistinct dusky spots between the eyes; in ♂ densely covered with tolerably long yellow hairs; the frontal gibbosity very large, prominent and densely haired in the ♂, not at all conspicuous in ♀; palpi often having the last three joints brownish or even black, sometimes also the first joint; flagellar joints of antennæ brown; in ♂ long and almost filiform; in ♀ short, the first four or five elliptical, the rest becoming slender or linear. Thorax considerably larger and more gibbous in ♂, also covered with tolerably long yellow hairs in ♂; the mesothorax usually more brownish or greyish in the ♀; four darker brownish stripes, sometimes only the two intermediate or often none (more often in ♂ specimens) traverse the mesothorax; the intermediate pair

* About the mean measurement.

extending from pronotum to the suture; the lateral one short, starting from below the humeri; pleuræ with a distinct hoary bloom in ♀; scutellum and metanotum ochreous or brownish ochreous in both sexes; covered with tolerably long yellow hairs in the ♂. Halteres with a brownish club. Abdomen in ♂ not much longer than the thorax, shining, pubescent, the last three or four segments often brownish and the terminal segment usually black or dark brown; in ♀ once and half or twice the length of the thorax, hoary grey or brown, usually dull, the first one or two and last two or three segments and venter usually more ochreous or brownish ochreous. Legs with the femora and tibiæ brown or blackish at the apex; tarsi brown or blackish, the basal half of metatarsal joint usually more brownish ochreous (Pl. vi., fig. 49). Wings almost hyaline, with a slightly greyish tint; the anterior border, including first basal cell (except apical fourth), to anterior branch of second longitudinal vein, brown; first submarginal and apical portion of second submarginal cell, and the fifth longitudinal vein, more or less distinctly clouded with yellowish; veins brown, more ochreous towards the base; anal angle more distinct in ♂ (especially in well-developed specimens).

Hab.—Generally distributed throughout Australia. Blue Mountains and several localities in N.S.W. (Masters and Skuse); Mount Kosciusko, N.S.W., 3,500 ft., in March (Helms); *several specimens in Coll. Australian Museum*; Tasmania, Victoria, South Australia and Western Australia (Masters); Glass Mountains, Queensland (C. J. Wild), *specimens in Coll. Queensland Museum*. Common from August to December, among grass and low bushes.

Obs.—After carefully examining and comparing a very large number of specimens from all parts of Australia I cannot but feel convinced that all the hitherto described specimens appertain to the same species. The only differences in the descriptions appear to be of a very trivial nature; for instance, what Walker and Macquart call "ferruginous," Westwood calls "fulvo-ochraceous,"

Erichson "luteous," and Jænnicke "rust-yellow." One author says that the thorax has "four reddish lines," whilst another, only noticing the interstices of these, states "three pale lines." Westwood in describing his *M. dimidiata* says "thorace interdum obscurius bivittato," which is also true of some specimens before me all four stripes or perhaps only the two short lateral ones being subject to obliteration. Osten-Sacken (Studies I., p. 186), truly remarks that the thorax of *M. ornatus*, Jæn., appears "larger and more gibbose than usual," but the specimen from which the description was drawn is evidently a large, well-developed one, of which I have several. With regard to the palpi, authors differ; what Walker, perhaps carelessly, calls "black" (as they seem only rarely entirely black), others call "blackish-brown, yellow at the base," "brownish, yellow at the base" or even "yellow, black at apex." All agree in the colours of the antennæ, abdomen and legs, only differing in the terms employed to denote them. The size of the insect is variously stated, but then among the specimens before me there are those which will answer to each case; whilst the length of the male antennæ which is only noticed by Schiner (at 24 lines) varies in length from 22 to 30 lines with almost imperceptible intermediate gradations.

II. ♂ antennæ about the length of a wing.

427. *MACROMASTIX HELMSI*, sp.n. (Pl. v., fig. 22.)

♂.—Length of antennæ.....	0.525 inch	..	13.32 millimètres.
Expanse of wings.....	0.540 × 0.120	...	13.70 × 3.04
Size of body.....	0.380 × 0.070	...	9.64 × 1.77
♀.—Length of antennæ.....	0.060 inch	...	1.54 millimètres.
Expanse of wings.	0.540 × 0.120	...	13.70 × 3.04
Size of body.....	0.380 × 0.070	...	9.64 × 1.77

Head greyish-brown, more or less ochreous or fulvous; frontal gibbosity considerably more distinct in ♂; rostrum brownish-fulvous, sometimes tinged with blackish above and beneath

palpi black; joints of scapus brownish-fulvous, the flagellar joints black; in ♂ almost filiform, about the length of a wing; in ♀ short, the first four or five joints subcylindrical, the remainder almost linear. Collare dull brown. Thorax dull, yellowish-grey, with four more or less distinct brown stripes, the intermediate ones approximate, sometimes confluent, the lateral ones short, starting below the humeri; pleuræ hoary greyish; scutellum and metanotum fulvous or brownish-fulvous. Halteres brownish. Abdomen brown, shining in ♂, with a distinct hoary bloom in ♀; the first segment, anterior half of second, the anterior margin of some of the following, and the pectus, more or less brownish-fulvous or testaceous; last one or two segments black. Coxæ ochreous or fulvous, with a hoary bloom. Femora fulvous, black at the apex. Tibiæ darker than the femora, growing black at apex. Tarsi black. Wings with a greyish or very pale brownish tint; the anterior border brown (not so dark as the stigma), not so distinctly in first basal cell as in *M. costalis*; veins dark brown; anal angle slightly angulated a little before the tip of seventh longitudinal vein, inconspicuous in both sexes; the latter vein running rather close to and parallel with the margin.

Hab.—Mount Kosciusko, 5000-6000 feet, N.S.W. (Helms).
March. Several specimens in Coll. Australian Museum.

III. ♂ and ♀ antennæ short.

428. MACROMASTIX MASTERSI, sp.n. (Pl. v., fig. 23.)

♂.—Length of antennæ.....	0·105 inch	...	2·67 millimètres.
Expanse of wings	0·600 × 0·135	...	15·24 × 3·42
Size of body.....	0·400 × 0·090	...	10·16 × 2·27

Head (Pl. vi., fig. 52) yellowish-ferruginous, with two small indistinct brownish spots between the eyes; frontal tubercle rather prominent; rostrum ferruginous, as long as the head; nasus dusky; suctorial labella and palpi black, or dark brown; antennæ about the length of head and rostrum taken together; joints of scapus ferruginous, also the

following few flagellar joints more obscure, the remainder deepening into black; first four flagellar joints subcylindrical, the rest linear. Thorax yellowish-ferruginous, opaque, with four dull brownish longitudinal stripes; intermediate pair approximate, starting immediately below pronotum; lateral ones short, beginning below humeri; suture dark brown; pleuræ between fore and intermediate coxæ (and the pectus) with a grey bloom; scutellum and metathorax yellowish-fulvous. Halteres yellowish fulvous, with brown club. Abdomen shining; the first segment and anterior portion or whole of second fulvous or yellowish-fulvous; the following segments brown, sometimes obscure fulvous, the terminal two or three (and genitalia) black. Coxæ fulvous, the intermediate pair with a grey bloom. Femora obscure fulvous, more clear towards the base, and black at the apex. Tibiæ black, or dark brown growing black towards the apex. Tarsi black. Intermediate and hind tarsi rather more than twice the length of tibiæ. Wings with a distinct greyish tint; the anterior border fuscous, followed by a narrow almost hyaline streak; seventh longitudinal vein running tolerably close to and almost parallel with the margin; the anal angle more rounded off than in *M. Helmsi*.

Hab.—Sydney and Woronora, N.S.W. (Masters and Skuse)
Three specimens.

429. *MACROMASTIX CONSTRICTA*, sp.n.

♂.—Length of antennæ.....	0·075 inch	...	1·89 millimètres
Expanse of wings.....	0·570 × 0·120	...	19·47 × 3·04
Size of body.....	0·400 × 0·090	...	10·16 × 2·27
♀.—Length of antennæ.....	0·075 inch	...	1·89 millimètres
Expanse of wings	0·570 × 0·120	...	19·47 × 3·04
Size of body.....	0·450 × 0·080	..	11·43 × 2·02

Head yellowish-ferruginous, with four indistinct brownish spots between the eyes, the anterior pair very small, sometimes confluent with the posterior pair; frontal tubercle tolerably distinct

in the ♂, not so prominent as in *M. Mastersi*; rostrum ferruginous, shining, as long as the head, distinctly constricted before the middle (when viewed from above); palpi black; antennæ a little longer than rostrum; joints and scapus fulvous; flagellar joints black, the first four subcylindrical, the rest small, linear. Thorax light brown, opaque, sometimes darker towards pronotum, usually traversed by an indistinct ochreous median line; from humeri to origin of wings greyish-ochreous; suture dark brown; pleuræ, pectus, and all the coxæ with a grey bloom; scutellum and metathorax fulvous. Halteres with brown club. Abdomen in ♂ shining, brownish-fulvous, more obscure posteriorly, the last two segments of genitalia black; in ♀ slightly covered with a greyish bloom, all the segments, except the first and last, tinged and bordered with blackish, the sixth entirely black; venter obscure fulvous. Trochanters fulvous. Femora and tibiæ fulvous, the latter often brown in the intermediate and hind legs, black at the tip. Tarsi black. All the tarsi less than twice the length of the tibiæ. Wings with a pale brownish tint; anterior border and stigma brown; first posterior cell and fifth longitudinal vein slightly clouded; seventh longitudinal vein running close to and parallel with the margin.

Hab.—Como and Sydney, N.S.W. (Masters and Skuse). Several specimens.

Obs.—Easily distinguished from the last, which it most resembles, by its less distinct wing-colouring, shorter tarsi, constricted rostrum, and the colour of thorax and position of the seventh longitudinal vein.

430 MACROMASTIX OBSCURIROSTRIS, sp.n.

♂.—Length of antennæ.....	0·100 inch	...	2·54 millimètres.
Expanse of wings.....	0·660 × 0·140	...	16·78 × 3·55
Size of body.....	0·460 × 0·090	...	11·70 × 2·27
♀.—Length of antennæ.....	0·075 inch	...	1·89 millimètres.
Expanse of wings.....	0·600 × 0·140	...	15·24 × 3·55
Size of body.....	0·460 × 0·090	...	11·70 × 2·27

Head slate-grey or greyish-brown, with two very faint brownish or yellowish-brown spots between the eyes; frontal tubercle tolerably distinct in the ♂; rostrum the length of the head, deep brown or black, more or less reddish or fulvous at the sides; suctorial labella and palpi black; ♂ antennæ the length of head and rostrum combined, shorter in the ♀; joints of scapus fulvous orange; flagellar joints black, the first four subcylindrical, the rest linear. Thorax cinereous, opaque, traversed by four equidistant pale brown stripes; greyish-black behind the suture; pleuræ hoary greyish-black; scutellum and metathorax fulvous. Halteres brown. Abdomen brown, more or less tinged with fulvous or brownish-fulvous, somewhat shining (more so in ♂), covered with a slight greyish-bloom, the last two or three segments and genitalia greyish-black; venter greyish-fulvous. Coxæ hoary greyish; the trochanters fulvous. Femora fulvous or reddish-fulvous, growing black on the apical half. Tibiæ and tarsi black. In the ♂ the intermediate and hind tarsi rather more than twice the length of the tibiæ; in ♀ less than twice their length. Wings with a pale brownish tint; anterior border brown, but rather paler than the stigma; veins deep brown or black, the fifth longitudinal indistinctly clouded; seventh longitudinal vein running tolerably distant from margin.

Hab.—Mount Kosciusko, N.S.W., at 5,000 ft. (Helms).
March. *Several specimens in Coll. Australian Museum.*

431. *MACROMASTIX HUMILIS*, sp.n.

♂.—Length of antennæ.....	0.060 inch	...	1.54 millimètres.
Expanse of wings	0.500 × 0.110	..	12.70 × 2.79
Size of body	0.380 × 0.060	...	9.64 × 1.54
♀.—Length of antennæ.....	0.060 inch	...	1.54 millimètres.
Expanse of wings	0.500 × 0.110	...	12.70 × 2.79
Size of body.....	0.380 × 0.060	...	9.64 × 1.54

Head greyish, or slate-brown; front more gibbose anteriorly in the ♂ than in the ♀; rostrum about the length of the head,

black or brown, fulvous at the sides; suctorial labella and palpi black; antennæ in both sexes shorter than the head and rostrum taken together; joints of scapus fulvous, the second sometimes brown; flagellar joints black, the first five elliptical or subcylindrical, progressively diminishing in length and thickness, the rest linear. Thorax black, with a yellowish-grey bloom; pleuræ with a grey bloom; scutellum and metathorax fulvous. Halteres obscure fulvous, with a dusky club. Abdomen about three times the length of the thorax, black, with a slight greyish bloom, the first two or three segments more or less fulvous at the sides; genitalia brown or darker. Legs black, the femora fulvous on their basal half; coxæ with a grey bloom; trochanters fulvous. All the tarsi less than twice the length of the tibiæ. Wings with a pale greyish-brown tint, dark fuscous in the costal cell; all the veins and the first basal cell, also usually the posterior margin, somewhat infuscated with greyish; veins black; stigma brownish; the seventh longitudinal vein running close to and parallel with the margin.

Hab.—Benalla, Victoria (Helms). Six specimens in November.

EXPLANATION OF PLATES.

PLATE IV.

- Fig. 1. Wing of *Dolichopeza longifurca* (♀).
 Fig. 2. „ „ *varipes*.
 Fig. 3. „ *Tanypremna fastidiosa*.
 Fig. 4. „ *Ctenogyna bicolor* (♀).
 Fig. 5. *Clytocosmus Helmsi* (♂), perfect insect (natural size); 5a, antenna of ♂, 5b, terminal three joints; 5c, head viewed from the side; 5d, antenna of ♀, 5e, three flagellar joints viewed from the side, 5f, terminal three joints.
 Fig. 6. Wing of *Ptilogyna ramicornis* (♂).
 Fig. 7. „ *Platyphasia princeps* (♂).
 Fig. 8. „ *Plusiomyia gracilis* (♀).
 Fig. 9. „ „ *Olliffi* (♂).

PLATE V.

- Fig. 10. Wing of *Plasiomyia lineata* (♀).
 Fig. 11. „ *Habromastix cinerascens*.
 Fig. 12. „ „ *remota* (♀).
 Fig. 13. „ *Phymatopsis nigrirostris* (♂).
 Fig. 14. „ *Semnotes ducalis* (♀).
 Fig. 15. „ *Leptotarsus Macquarti* (♀).
 Fig. 16. „ *Acrucantha Sydneyensis* (♂).
 Fig. 17. „ *Ischnotoma verricornis*.
 Fig. 18. „ „ *par.*
 Fig. 19. „ „ *rubricornis*.
 Fig. 20. „ *Pachyrrhina australasia*.
 Fig. 21. „ *Macromastix costalis*.
 Fig. 22. „ „ *Helmsi*.
 Fig. 23. „ „ *Masteri*.

PLATE VI.

- Fig. 24. Male forceps of *Dolichopeza monticola*.
 Fig. 25. „ „ *planidigitalis*.
 Fig. 26. „ *Tanyprema fastidiosa*.
 Fig. 27. Male antenna of „ „
 Fig. 28. Male forceps of *Ptilogyna ramicornis*.
 Fig. 29. Male antenna of „ „
 Fig. 30. „ *Platyphasia princeps*.
 Fig. 31. „ „ *Plasiomyia gracilis*, viewed from side.
 Fig. 32. Female antenna of „ *incornata*, viewed from above.
 Fig. 33. Male forceps of *Habromastix cinerascens*.
 Fig. 34. Female antenna of „ „
 Fig. 35. Male antenna of *Phymatopsis nigrirostris*.
 Fig. 36. Male forceps of „ „
 Fig. 37. Female antenna of *Semnotes imperatoria*.
 Fig. 38. „ palpus of „ „
 Fig. 39. „ antenna of *Leptotarsus Macquarti*.
 Fig. 40. Male antenna of „ *scutellaris*.

- Fig. 41. Male forceps of *Acracantha Sydneyensis*; 41a, side-view.
 Fig. 42. „ antenna of „ *monticola*.
 Fig. 43. „ forceps of *Ischnotoma serricornis*.
 Fig. 44. „ „ „ *par*.
 Fig. 45. „ „ „ *rubriventris*.
 Fig. 46. „ antenna of „ *par*, viewed from beneath.
 Fig. 47. Terminal joints of tarsus of *Holorusia conspicabilis* (♂)
 Fig. 48. Head of *Macromastix costalis* (♂), viewed from side.
 Fig. 49. Terminal joints of tarsus of *M. costalis* (♂).
 Fig. 50. Male forceps of *M. costalis*.
 Fig. 51. Rostrum of *M. constricta*, viewed from above.
 Fig. 52. Head of *M. Mastersi* (♂), viewed from side.

NOTES AND EXHIBITS.

Mr. Etheridge exhibited the fossils described in his paper.

Mr. MacDonnell exhibited under the microscope mounted specimens of a mayfly of the genus *Baetis*, the males of some species of which have two pairs of compound eyes, one pair in the position ordinarily occupied by the compound eyes of flies, the other or extra pair being on peduncles or turrets. The specimens exhibited were found in a cobweb near Adelong, N.S.W., and mounted by Mr. H. Sharp.

Mr. A. Sidney Olliff exhibited (1) specimens of *Epicrocis terebrans*, Oll., (family Phycitidæ), from Gosford, Brisbane Water, a new moth which has done considerable damage to the red cedar trees (*Cedrela toona*, Roxb.) in the State Forest Nursery at that place, by burrowing in the larval state into the main stems or "leaders" of the trees; (2) a specimen of *Adela*, evidently a new species, captured at Kangaroo Mt., Broughton Creek, N.S.W., in April last. The only recorded Australian representative of the genus, *Adela aethiops*, F. & R., is very different, as far as can be judged from Felder's figure in the "Reise Novara," as it has the forewings ornamented with three distinct transverse fasciæ; and (3), on behalf of Mr. R. Helms, a species of *Synemon* (family Castniidæ), from Benalla, Victoria, showing a remarkable disparity in the sexes in form, marking, and colour.

Mr. Thomas exhibited specimens of petroleum shale from Joadja Creek, N.S.W., coated with botryoidal or mammillated iron pyrites.

Mr. Norton exhibited the larva of *Melolontha* sp., infested with a fungus, probably a species of *Cordyceps*, dug up in his garden at Double Bay.

Mr. Skuse exhibited specimens of the Tipulidæ described in his paper.

Also, specimens of the "fly" or plant bug which has recently appeared in such innumerable multitudes in certain vineyards and orchards in N.S.W. and Victoria. The specimens were received from Mr. Lankester, of Ettamogah vineyards, for identification. The species, which is possibly undescribed, is generally distributed in Australia, and belongs to the family Capsidæ. The bug is related to the famous American Chinch bug, which sometimes abounds in that country so as almost to completely destroy the corn crop. It is 2 lines in length. Colour of body varying from brown to blackish, more or less variegated on the head and thorax with ochreous-yellow or reddish. Antennæ thread-like, barely $\frac{2}{3}$ the length of the body, consisting of four joints; first joint short, thicker than the rest; second the longest, being more than twice the length of the first; third and fourth of about equal length, the latter rather thicker than the third. Head about the width of the thorax, provided with two prominent black eyes, between which, near the hindmargin, two widely separated ocelli or simple eyes are discernible. Wings transparent, their basal coriaceous portion with three longitudinal dark brown markings on the posterior margin. Legs ochreous-yellow, the thighs numerously spotted with brown, the hind pair sometimes mottled with dark brown on their apical half. The rostrum springs from the front of the head, and in repose is closely applied to the body between the bases of the legs; it is very long, extending as far as the hind pair of legs; that is, about $\frac{2}{3}$ the length of the entire insect.

Mr. Olliff remarked that he also had examined specimens of the same species of plant-bug, forwarded to him from Victoria, and that in his opinion they were referable to the genus *Rhyparochromus* (Fam. Lygæidæ, Tribe Capsina).

Mr. Froggatt exhibited some fig leaves from a garden near Manly, which had been stripped of their cellular tissue by the

larvæ of *Galeruca semipullata*, Clark; also, specimens of the larvæ, chrysalids, and the perfect insects with drawings of the same. Though apparently most partial to the cultivated fig (*Ficus carica*), the insects were also to be found on one of the native figs (*F. rubiginosa*) in the garden from which the specimens exhibited came.

Baron von Mueller sent for exhibition a specimen of *Boronia Adamsiana* described in his paper.

Mr. Miskin contributed the following "Note on *Danaïd Petilia*, Stoll. In the Proceedings of the Society (Vol. IV. 2nd Ser. p. 119) appeared a note contributed by myself, in which I endeavoured to explain the distinction between this—one of our commonest species—and *D. chrysippus*, L., which latter does not occur in Australia. In an editorial foot-note appended thereto, which rather inconsequentially ignores the whole drift of my remarks, reference is made to specimens of an insect from North-West Australia in the Macleay Museum. Having had an opportunity of inspecting these specimens, upon a recent visit to Sydney, I found them to be a small form of *D. genutia*, Cr. (*plexippus*, L.,* a species not hitherto credited as Australian), the wide black veining of the secondaries determining the species readily. I observe one error in my note, which I now correct, i.e., the reference to Godart's as the *only* description; a description is also contained in Stoll's Supplement. A later careful comparison of both descriptions confirms the correctness of my conclusions."

Mr. North on behalf of Mr. K. H. Bennett sent for exhibition a set of the eggs, three in number, of the Glossy Ibis, *Ibis falcinellus*, Linn., taken at Yandembah, New South Wales, by Mr. Bennett on the 2nd of November, 1889. At a meeting of this

* Linné's name has, through a mistaken habitat (America) given by him, given rise to so much confusion in the identity of his species, that the adoption of Cramer's name is rendered desirable, for certainty.—W. H. M.

Society in November last, Mr. Bennett contributed some interesting notes on the breeding-places of this bird. The eggs are lengthened ovals in form, and are of a deep greenish-blue colour, the shell being slightly rough in texture and lustreless; they measure as follows, length (A) 1.94×1.33 inch; (B) 1.9×1.35 inch; (C) 1.97×1.31 inch. A set in the Australian Museum vary from pyriform to a lengthened oval, one specimen being somewhat sharply pointed at one end. Length (A) 2.16×1.48 inch; (B) 2.21×1.4 inch; (C) 2.2×1.47 inch. The eggs of the Glossy Ibis can readily be distinguished from those of any other Australian bird by the intensity and depth of their colouring.

WEDNESDAY, 26TH MARCH, 1890.

Mr. P. R. Pedley in the Chair.

The Chairman announced that Mr. Henry Deane, M.A., had handed over to the Society the greater portion of his extensive and valuable collection of Australian Plants, a few orders being retained for the present for further study.

DONATIONS.

"The Botany of the Voyage of H.M.S. 'Herald' during the years 1845-51." By Berthold Seemann, Ph.D., F.L.S. *From Baron von Mueller, K.C.M.G., M.D., Ph.D., F.R.S.*

"The Perak Government Gazette." Vol. III., Nos. 1-5 (Jan. and Feb., 1890). *From the Government Secretary.*

"Bollettino dei Musei di Zoologia ed Anatomia comparata della R. Università di Torino." Vol. IV., Nos. 67-73 (1889). *From the Museum.*

"Report on the Eruption of Tarawera and Rotomahana, N.Z." By A. P. W. Thomas, M.A., F.L.S. *From the Author.*

"The Australasian Journal of Pharmacy." Vol. V., No. 50 (Feb., 1890). *From the Editor.*

"Feuille des Jeunes Naturalistes." No. 232 (February, 1890). *From the Editor.*

"Records of the Australian Museum." Vol. I., No. 1 (1890).
From the Trustees.

"Geological and Natural History Survey of Canada.—Contributions to Canadian Palæontology." Vol. I., Part 1. By J. F. Whiteaves, F.G.S., F.R.S.C., &c. *From the Director.*

"Bulletin of the Museum of Comparative Zoology at Harvard College, Cambridge, U.S.A." Vols. XVI., No. 6, XVII., No. 6 (1889); "Annual Report of the Curator for 1888-89." *From the Curator.*

"Proceedings of the Canadian Institute, Toronto." 3rd Series, Vol. VII., Fasc. 1 (1889). *From the Institute.*

"The Canadian Record of Science." Vols. III., No. 8 (1889); IV., No. 1 (1890). *From the Natural History Society of Montreal.*

"Bulletin of the American Geographical Society." Vol. XXI., No. 4 (1889). *From the Society.*

"Bulletin of the American Museum of Natural History." Vol. II., No. 3, two sheets (pp. 245-276). *From the Museum.*

"The Forest Flora of South Australia." Part IX. By J. E. Brown, F.L.S., Conservator of Forests for the Government of S.A. *From the Government Printer, Adelaide.*

"Annales de la Société Belge de Microscopie." Tome XIII., Fasc. 2 (1889). *From the Society.*

"Reichenbachia.—Orchids Illustrated and Described by F. Sander, &c." Vol. II., Parts 6 and 9. *From Sir William Macleay, F.L.S., &c.*

"The Victorian Naturalist." Vol. VI., Nos. 10-11 (Feb.-March, 1890). *From the Field Naturalists' Club of Victoria.*

A Leaflet entitled "Macrosamia (Encephalartos) Gum." By J. H. Maiden, F.L.S., F.C.S., &c. *From the Author.*

"The Transactions of the Entomological Society of London for the year 1889." Part V. *From the Society.*

"Zoologischer Anzeiger." XIII. Jahrg., No. 327 (1890). *From the Editor.*

"Société Botanique de Lyon.—Bulletin Trimestriel." vii. Année, No. I. (Jan.-March, 1889). *From the Society.*

NOTES ON AUSTRALIAN COLEOPTERA, WITH DESCRIPTIONS OF NEW SPECIES.

BY THE REV. T. BLACKBURN, B.A., CORR. MEM. LINN. SOC. N.S.W.

PART VI.

CALLOODES.

This genus appears to be of very doubtful validity. Its author mentions no definite character. M. Lacordaire sinks it as synonymous with *Anoplognathus*. But in 1874 (Trans. Ent. Soc. p. 537) Mr. C. O. Waterhouse states that it is a good genus and mentions as salient distinctive characters that the anterior tibiae are simply produced at the apex on the outer side,—having no teeth on the outer edge,—and that the apex of each elytron is slightly produced into a point. I do not believe the latter character is a satisfactory one, for there are species of *Anoplognathus* (e.g. *Boisduvali*, Dup., and *nebulosus*, MacL.) having the elytra quite as decidedly produced apically as those of any *Calloodes* I have seen,—and I think I know all the species that have been attributed to the genus; the former character appears to me equally unsatisfactory for in some species of *Calloodes* at least it pertains to only one sex, and in others to neither. In *C. Mastersi*, MacL., (which most decidedly has entirely the facies and style of coloration of *Calloodes*) the front tibiae are externally dentate in both sexes, while in *C. prasinus*, MacL., they are dentate in one sex (apparently the ♂!) only. *C. Atkinsoni*, Waterh., I am not absolutely sure that I know; the type I should judge to be a male,—if so a female *Calloodes* in my collection probably appertains to the species (though it differs from the description in having the elytra slightly dilated in the middle of the lateral margin as in some *Anoplognathi* (♀) and also a little differently punctured as well as the usual sexual characters); its front tibiae have a single very feeble and obtuse external tooth besides the apical prolongation.

I am sorry that I can suggest no structural characters for the genus more reliable than those I have criticised, but after a protracted examination of a fairly numerous series of *Anoplognathi* and *Calloodes* I can find not one structural character nor any combination of structural characters that seem confined to and invariable in either genus. Nevertheless the distinction of the genera seems very desirable, for the species called *Calloodes* certainly differ from all described *Anoplognathi* in being genuinely metallic insects of pure brilliant colours (instead of being of some shade of red or testaceous with more or less metallic gloss or shimmer), of a wide *Dytiscus*-like form somewhat (though not very greatly) different from that of most if not all *Anoplognathi*.

CALLOODES FRENCHI, sp. nov.

Argenteo-viridis; nitidissimus; supra vix perspicue (capite excepto) punctulatus; elytris vix striatis; prothorace medio postice haud emarginato; labro, mento, antennis, palpis, pedibusque testaceis; corpore subtus (metasterni segmentorumque ventralium lateribus exceptis) vix perspicue punctulato, parce albido-piloso; mesosterno fortiter producto; pygidio sparsim obsolete punctulato, apice leviter barbato.

[Long. 7-8, lat. $3\frac{1}{2}$ - $4\frac{1}{2}$ lines.

Maris clypeo antice sat anguste producto sparsim punctulato, supra obsolete bi-tuberculato; coxis anticis externe ad apicem bidentatis; unguiculis simplicibus.

Feminae clypeo antice rotundato crebre punctulato; coxis anticis externe tridentatis; unguiculis externis anticis bifidis.

The clypeus in the male narrows forward for more than half its length and then dilates very slightly to its apex which is much narrower than its base, the front margin being gently rounded (in *C. Mastersi* the clypeus of the male is almost parallel-sided in its hinder two-thirds and then dilates to its apex which is quite as wide as its base).

The species closely resembles *C. Mastersi*, MacI., in colour, but the beautiful silvery gloss that overspreads its green colour is even

more conspicuous. It differs completely from *C. Mastersi* in having the mesosternal process long and prominent, and also is very much less distinctly punctulate than that species (except on the clypeus of the female); the clypeus of the male differs as mentioned above; the lateral edging of the prothorax is continued from the hind angles only a very short distance along the base, and the base is less (in the male before me not at all, in the female scarcely) emarginate in the middle; in both sexes of *C. Mastersi* it is evidently though slightly emarginate; the elytra of *C. Frenchi* are not striated but bear some longitudinal scratch-like lines,—more conspicuous in the female than in the male,—the puncturation in the former sex being not quite so obsolete as in the latter.

North Queensland; presented to me by C. French, Esq., Colonial Entomologist of Victoria.

ANEURYSTYPUS RICHARDSÆ, sp.nov.

Castaneus; subtus dense longe fulvo-hirsutus; capite sat crebre, prothorace et scutello sparsim subtiliter, pygidio (apice sublævi excepto) sat crebre subrugulose, elytris subseriatim sat fortiter, punctulatis. [Long. 6-7, lat. $3\frac{1}{2}$ -4 lines.

Mas. Antennarum flagello articulis ceteris conjunctis vix longiori; prothorace antice impresso, margine anteriori acute elevato.

Fem. Latet.

Closely allied to *A. calvus*, Blackb., from which it differs as follows: the club of the antennæ in the male is very much shorter (in *A. calvus* it is about twice as long as all the other joints together); the prothorax and scutellum are much less strongly punctured and the former is differently shaped, its greatest width being scarcely more than half again its length down the middle, the sides being somewhat parallel in the hinder half whence they converge arcuately to the front, and the base being much less strongly bisinuate (so that its middle part appears to be less lobed hindward) and being scarcely or not margined (in *calvus* the margin is well defined). The bunches or fringes of hairs over the scutellum and pygidium are much less dense (possibly this might

not be the case in a fresh example), the puncturation of the elytra is not so distinctly seriate, and the puncturation of the basal portion of the pygidium is very much closer and more rugulose, though scarcely so strong.

The comparative shortness of the flagellum of the antennæ might appear suggestive of merely sexual difference between this and the older species, but I think there is no doubt that all I have seen of either species are males, since not only are the prothoracic excavation and armature similar (though varying a little in individual development) but they all have the anterior ventral segments very short and the hind tarsi moderately long, whereas in *Corynophyllus*, *Cavonus* and other allied genera the former are much longer, and the latter much shorter in the female than in the male. It is hardly likely either that all the examples before me from one locality should be males and all from another locality females. The external teeth of the front tibiæ are strong and sharp as in *A. calvus*; in one example however they are more feebly developed, and this I take to be merely an individual peculiarity, though it may possibly be indicative of a third closely-allied species.

Taken in the Lake Eyre Basin by Mrs. Richards of Beltana, a lady who has long been a successful and interested collector of the Australian fauna in various parts of S. Australia, and whose work I am glad of the opportunity of commemorating by the association of her name with one of the S. Australian species she has collected.

N.B.—In characterising the genus *Aneurystypus* I stated that it differed from *Corynophyllus* in the mouth organs as well as in the shape of the flabellum. The mouth organs of *A. Richardæ* however are not quite like those of *A. calvus*; the mentum being slightly wider (but quite distinct from that of the *Corynophylli* I have dissected) while the maxillary palpi come nearer to *Corynophyllus*. I suspect that the mouth organs are given to vary specifically in insects that cannot be generically separated, and are not very reliable characters for generic distinction (at any rate in the *Dynastidae*). The narrow flabellum of the antennæ however

strongly distinguishes *Aneurystypus* from *Corynophyllus*, and is accompanied by an evident difference of general facies which I think justifies the validity of the separation. In *A. Richardsæ* the 2nd joint of the maxillary palpi is distinctly shorter and less pyriform than in *A. calvus*.

GLYCYPHANA SUBDEPRESSA, sp.nov.

Sat depressa ; haud pilosa ; purpureo-nigra, prothoracis disco obscuriori, capite antice rufescenti ; prothoracis disco, elytrorum fasciis 2 interruptis maculisque nonnullis, pygidio ad latera, et corpore subtus, maculatim albidis ; capite fortiter punctulato ; prothorace quam longiori fere dimidio latiori, sparsim leviter sat crasse squamoso-punctulato, angulis posticis nullis ; elytris singulis 2-costatis (costis postice connexis), in parte dimidia antero-interna vix perspicue punctulatis, latera apicemque versus punctulatis, strigis transversis prope margines laterales pro puncturis substitutis ; pygidio transversim sat crebre rugato ; sternis arcuatim, segmentis ventralibus transversim subseriatim, crasse punctulatis ; tibiis anticis 3-dentatis, dentibus 2 apicalibus altero sat longioribus.

[Long. $7\frac{3}{4}$, lat. 4 lines.

The hind angles of the prothorax are completely rounded off and the base is moderately and arcuately emarginate in the middle, the front margin is somewhat produced in the middle, and is less than half as wide as the widest part of the segment, the front angles being very obtuse but not quite rounded off. The markings on the elytra are probably variable ; in the example before me there are on each elytron (a) a few small spots (mostly forming longitudinal lines) in the front half, (b) two transverse larger spots forming an interrupted fascia (one touching the lateral margin just behind the middle and thence running obliquely towards the hind end of the scutellum, but extending less than half the distance thereto, the other placed quite transversely on a level with the external end of its oblique fellow and reaching from the outside of the sutural carina to the inner edge of the outer elytral costa), (c) a narrow line somewhat within the apical border but not reaching

the suture. The outer costa on the elytra curves from the shoulder (towards the suture) to a callus near the apex, about half way between the suture and lateral margin; the inner costa is nearly parallel to the outer one, is nearer to it than to the suture, and joins it on the subapical callus. Both costæ are wide and rounded and (except near their apex) only feebly defined; the front half of the space between them is occupied by a double line of elongate scratch-like punctures which become continuous or stria-like in the hinder half, a similar stria-like scratch bordering the inner edge of the inner costa in its hinder half, and another (interrupted in the middle) running close outside the sutural costa. Outside the outer costa genuine puncturation begins, which, however, in the hinder half of the elytron, and at its apex, changes near the margin into a system of transverse strong scratches. The upper tooth on the external margin of the front tibiae is similar to the lower ones but decidedly smaller than them. The mesosternal process projects forward in a somewhat tubercle-like manner from the level of the intermediate coxæ.

This species belongs to a section of *Glycyphana* not previously recorded as Australian, distinguished from the section in which *C. brunnipes*, Kirby, falls by the absence of scale-like hairs on the upper surface, the teeth on the anterior tibiae, and many other characters. It is structurally near to some Javanese species, but I do not know of any that resembles it specifically,

N. Queensland; presented to me by C. French, Esq.

NEOCURIS VIRIDIAUREA, MacI.

In my own collection there is an example, and the South Australian Museum contains another, which would not appear capable of being separated from this species, as described by its author. The species belongs to the section of the genus (as divided by M. Fairemaire), having the head devoid of a longitudinal excavation: in my example the head is not quite absolutely without indications of concavity down the middle, but in that of the South Australian Museum, and also that

described by Sir William Macleay, the impression appears to be in no way even indicated. In that section the present insect is the only one hitherto described of uniform colour; it bears much general resemblance to the species of the first section (especially *N. viridimicans*, Fairm.), but differs from most or all of them in its head being much less produced forward, as well as devoid of a longitudinal excavation. It is doubtful whether these insects were taken in the N. Territory or in S Australia proper, the record of particulars of capture being absent in the case of each of them.

NEOSPADES (CORÆBUS) CHRYSOPYGIUS, Germ.

Mr. Duboulay has recently sent me this species from Victoria, and I have seen a considerable number of examples taken in S. Australia. I find that the colouring of the elytra varies much. The example described by me (Trans. Roy. Soc. S.A. X. p. 251) was a brightly coloured one. The green colouring of the elytra, however, is liable to be wanting in varying degrees until in some examples the elytra are of an almost uniform dull coppery colour, with some patches of grey scales. There does not seem to be much difference in description between this insect and *C. Westwoodi*, L. and G. If they are identical, the latter name will take precedence.

PTEROHELÆUS GEMINATUS, sp.nov.

Oblongus; vix nitidus; subconvexus; niger, labro testaceo, antennis palpis tarsis et marginibus reflexis subferrugineis; prothorace vix canaliculato, antice fortiter arcuatim emarginato, subtiliter sparsius punctulato, ad basin utrinque foveolato, marginibus concavis subæqualiter sat latis; elytris subtiliter (postice vix evidenter) seriatim punctulatis, seriebus in disco geminatis, marginibus concavis apicem versus gradatim angustatis.

[Long. $8\frac{1}{4}$, lat. $4\frac{1}{8}$ lines.

The lines of punctures (which are very fine, even finer than those of *P. nitidissimus*, Pasc.) on the elytra are arranged as

follows ; next the suture (which is not elevated) is a rather wide lævigata space ; then come 4 lines of punctures close together and a little confused *inter se*, then a lævigata interval, then 4 lines similar to those already described, then a lævigata interval, then 2 lines of punctures followed by a lævigata interval, beyond which are 2 more lines of punctures and then another lævigata interval, between which and the margin the puncturation is a little stronger and much confused. In the basal $\frac{1}{8}$ part of the elytra the punctures are spare and quite confused, and in the apical $\frac{1}{2}$ they become so faint as to be scarcely visible under a strong lens. The elytra though sub-opaque have a slight silky gloss.

This species seems to resemble *P. agonus*, Pasc., which however is very insufficiently described, no information being given (*ag.*) as to the form of the prothoracic and elytral margins. That insect would seem to be much smaller (long. 5-6 lines) than the present one, and the lines of punctures on the elytra to be evenly spaced ; nor is there any mention of the lines of punctures on the elytra being confused at the base and obsolete towards the apex, nor of the conspicuous foveiform impression at the base of the prothorax on either side intermediate between the middle line and the margin ; the prothorax moreover is said to be "nearly impunctate," whereas in the present species that segment under an ordinary lens is *very distinctly*, though finely, punctulate. It would probably be impossible to identify *P. agonus* positively except by examination of the type.

Northern Interior of S. Australia ; taken by Mrs. Richards, probably in the Lake Eyre Basin.

DISTERNA.

This genus appears to me far too near *Zygocera* to be placed, as Lacordaire places it, in a different "Groupe" of the *Lamiidæ* ; I am even a little sceptical as to its right to be separated from *Zygocera* at all : in Masters' "Catalogue descr. Col. of Australia" its species appear under *Zygocera*. Lacordaire distinguishes the "groupe" *Disternides* from the *Zygocerides* by the absence of an oblique sinus on the intermediate tibiæ and the truncation of the

prosternum in front. Now if *Zygocera pruinosa*, Boisd., be compared with various other species that have been described as congeneric with it, it will be found that in few if any of the latter is the intermediate tibia absolutely without any trace of the oblique sinus [it is scarcely less marked in (*Disterna*) *plumifera*, Pasc., than in *Zygocera canosa*, Er.], and also that the form of the prosternum varies somewhat [*e. g.* being very much different in (*Disterna*) *plumifera*, and very little different in (*D.*) *lugubris*, Pasc., from the same in *Zygocera pruinosa* and *canosa*]. On the other hand the facies and style of markings differ so little except in degree, and there is so striking a character common to all the Australian species hitherto attributed to either genus, viz., the presence in one sex at least of a large apical or subapical depression or fovea on the more or less glabrous last ventral segment, that I do not see how they can be regarded as at most more distinct than two closely allied genera. I cannot see how they are to be differentiated more strongly than as follows: ZYGOCERA, surface nitid with scanty pubescence forming spots or fasciæ, external sinus of intermediate tibiæ fairly well developed; DISTERNA,—pubescence much more extended on the surface rendering it in general opaque; external sinus of intermediate tibiæ almost or quite obsolete.

The degree of contiguity of the base of the antennæ varies but does not seem to be generic [*e. g.* *Z. canosa* and *D. lugubris* appear intermediate in this respect between *Z. pruinosa* and *D. plumifera*].

GLENEA.

I have recently received from Mr. French, the Victorian Colonial Entomologist, an example of this genus (hitherto not recorded, as Australian), which that gentleman tells me was taken in North Queensland. It does not appear to me to differ specifically from *picta*, Fab., which has a wide distribution in Polynesia.

CALOMELA EYREI, sp. nov.

Oblonga; fulvo-testacea, capite elytris et prothoracis sternique lateribus plus minus viridi-tinctis, antennis apicem versus piceis;

capite fortiter et crebre, prothorace (disco sparsim subtiliter, latera versus crassissime) elytris subtiliter confuse (his suturam versus subseriatim) punctulatis. [Long. 2-2½, lat. 1 line.

The prothorax is twice as wide as it is long down the middle, its front margin being very little wider than the base, the sides very gently arched and the surface even, transversely rather strongly convex; the front margin is widely and feebly emarginate, and is widely and strongly produced in the middle; all the angles are sharp. In a brightly coloured example the whole of the head scutellum and elytra, together with the margins of the prothorax, appear in a certain light of a bright clear green colour, while, from a different point of view, the colour appears more purplish; in more feebly coloured specimens the same parts are of a fulvous hue suffused with a metallic green gloss. In all the examples I have seen the elytra are quite unicolorous.

Compared with *C. Curtisi*, Kirby, this species (apart from differences of colour and size) has the elytra and the disc of the prothorax very much more feebly punctulate, the sides of the prothorax much less strongly and more evenly arched, and the front margin of the same strongly and almost evenly bisinuate, instead of being somewhat evenly and very deeply emarginate.

Interior of S. Australia, Lake Eyre Basin, or thereabouts: taken by Mrs. Richards.

TWO NEW INSTRUMENTS FOR BIOLOGISTS.

BY N. A. COBB.

(Plate VII.)

THE DIFFERENTIATOR.*

The differentiator is an instrument which was invented to assist in avoiding to the greatest possible extent those annoying and often destructive contractions which occur in delicate organisms while they are being killed and preserved. These contractions fall into two groups : (1) those which occur before death, due to the action on the organism of the fixation fluids, (2) those occurring during the process of bringing the organism into the fluid in which it is to be finally preserved. Among the latter is an often unavoidable contraction due to transferring to alcohol of successively increasing strength. This contraction takes place with something like equality in the different parts of the organism and is very slight,—much slighter than is commonly supposed, because other contractions or distortions are confounded with it, the whole being denominated shrinkage. Only when the distortions and breakages due to diffusion currents are annihilated does one begin to see how insignificant the unavoidable and true shrinkage really is.

The differentiator is made from glass tubing having an internal diameter varying from five millimeters upwards.

According to the nature of the fluids in use, the instrument takes one of the two forms illustrated in Figs. 1 and 2. As will be seen, *a* or *a'*, the *reservoir*, and *b*, the object-cylinder or *object-box* as well as *c*, the *filter*, are three pieces of glass tubing joined together

* This instrument has been already described in the report (1889) of Prof. Sladen, Secretary of the British Association Committee appointed to manage the Association's table at the Naples Zoological Station. A description also appeared in the *American Naturalist*, August, 1889. I have since made improvements which render a new description with figures not inexcusable.

by means of caoutchouc tubing. The filter, *c*, is easily made as follows: take a piece of glass tubing twice the length of the required filter, heat it red hot, draw it out to arm's length and break it in two in the middle; remove all the capillary part except about three inches on each half, heat, and bend into the required form (*c*); next carefully heat the capillary portion near its extremity in a small alcohol flame, draw out exceedingly fine and break off so as to leave a minute orifice. All sharp edges should be rounded off by heating.

To use the differentiator, proceed as follows. Suppose objects fixed by corrosive sublimate are to be studied in balsam after staining with borax-carmines. Fill the filter with perfectly clean sublimate solution and insert a plug of cotton (previously boiled in water to remove the air) at the u-bend (*v*, Fig. 3). Join the object-box to the filter, fill up with sublimate solution, and push a plug of cotton into the lower end of the box, avoiding bubbles. Wrap the cotton in fine linen if the objects are minute. Put the objects into the box, plug the upper end in the same manner as the lower end, and finally join the box and filter thus filled to the empty reservoir *a*, and hang the instrument up in the position illustrated. The objects are now transferred to 33 per cent. alcohol in the following manner: mix equal parts of sublimate solution and 33 per cent. alcohol (call this mixture 2). Mix equal parts of 2 and sublimate solution (call this 1). Mix equal parts of 2 and 33 per cent. alcohol (call this 3). Add mixture 1 to the reservoir until it is one-fourth full, mixture 2 until it is half full, mixture 3 until it is three-fourths full, and then fill up with 33 per cent. alcohol. If the successive mixtures are added with sufficient care, they will, owing to difference in specific gravity, remain distinct. If forced rapidly in, a nearly uniform mixture of about equal parts sublimate solution and 33 per cent. alcohol will result. The desirable procedure lies between these two suppositions, and gives rise to a uniform gradation or *differentiation from sublimate solution to 33 per cent. alcohol in passing upwards through the reservoir*. A good procedure which always secures this result is to add the successive fluids carefully and then to dance

a long fine wire up and down in the reservoir for a few seconds. The flow, which at once commences drop-wise from the point of the filter, should be so regulated, either by tipping the instrument, or by breaking off more or less of the capillary part of the filter, as to cause the reservoir to be emptied in from two to five hours, when the objects will of course be in 33 per cent. alcohol, having been *guarded to the utmost* against diffusion currents. They are now to be transferred to borax-carminc, a fluid *heavier* than 33 per cent. alcohol, by the use of reservoir *a'*. Fill the long arm of the reservoir with borax-carminc, and cork it, leaving the short arm empty and open. Mix equal parts of carminc and 33 per cent. alcohol (call this mixture 2). Mix equal parts of 2 and carminc (call this 1). Mix equal parts of 2 and 33 per cent. alcohol (call this 3). Add mixture 1 to the short arm of the reservoir until it is one-fourth full, mixture 2 until it is half full, mixture 3 until it is three-fourths full and fill up with 33 per cent. alcohol. Transfer the object-box and filter to *a'*, avoiding bubbles, and uncork the long arm. The flow begins as before, but this time *upward* through the object-box, and the objects are thus transferred in from two to five hours to borax-carminc.

After staining, the objects are transferred to 50 per cent. alcohol by means of a reservoir *a*, the flow being so regulated that the change takes place in from ten to twenty hours. Then change successively to acidulated 70 per cent., 90 per cent., and absolute alcohol, allowing at least ten hours for each change. Transfer to turpentine, chloroform, oil of cloves, or any oil desired by reservoir *a'*. Finally to thin balsam, *still by means of the differentiator*.

Whenever the objects are to be transferred to a lighter fluid, use reservoir *a*; whenever they are to be transferred to a heavier fluid, use reservoir *a'*. If objects are to be transferred to glycerine, transfer first to 50 per cent. glycerine in twelve hours, and then to pure glycerine in twenty-four hours.

Objects which defeat successful fixation by untimely contractions may be rendered insensible by means of the differentiator, and then fixed *perfectly outstretched*. Transfer them in the differentiator to alcohol of from 5 to 30 per cent. (or other

paralyzing solution such as chloral hydrate) in from two to three hours, when they will be insensible and outstretched, and may be fixed as desired. A specially large object-box is easily contrived for larger specimens.

If the objects to be treated are very minute, I now arrange the object-box as illustrated in Fig. 4. Taking a piece of glass tubing, whose external diameter is slightly less than the internal diameter of the object-box, I cut therefrom two pieces, each about 5 mm. long, and round off their sharp edges by heating. Call them rammers. I then cut from the finest linen some circular patches having a diameter slightly greater than the external diameter of the object-box. The next operation consists in taking one of the rammers and with it forcing a wetted patch into one end of the object-box. (Fig. 4, *d*, *e*.) To do this successfully, care should be taken to arrange the patch concentrically on the end of the object-box, and to place the rammer precisely upon the middle of the patch. The patch is to be forced in only so far as is represented in Fig. 4. The rammer may be allowed to remain in, or, if the fit has been a snug one, may with safety be removed, the patch remaining in place by virtue of its own elasticity; the latter is the preferable procedure. Join the object-box, open end uppermost, to the filter, fill up with the fixation fluid, put in the objects, and arrange the upper end of the box with a patch and the remaining rammer. Bubbles must be avoided. The pieces of linen give much less trouble in the end than plugs of cotton, in which minute objects are liable to get lost. In this manner I have treated such minute organisms as rotifers, paramaecium, &c., without loss of specimens. The most delicate organisms return from this treatment in perfect condition.

The flow from the capillary orifice of the filter is best regulated by varying the inclination of the instrument. The flow is fastest when the instrument hangs in a vertical position, and decreases as the position of the instrument is made to approach the horizontal. When the instrument is in a horizontal position there is no flow. A convenient means of varying the inclination of the differentiator

will be found in the rack now to be described. A strip of wood, whose length must be regulated by the number of differentiators it is desired to use, has driven through it, at intervals of from twelve to eighteen inches, long wire nails, whose points will then project an inch. The strip of wood so prepared is fastened in a horizontal position with the nail-points also in a horizontal position. Take a large cork, perforated to fit, and slide it on to the differentiator reservoir. Move the cork back and forth until the whole instrument will balance when left free with the cork resting on the fore-finger—in short, place the cork opposite the centre of gravity. If the cork in this position be impaled upon one of the nails, the latter will be found to afford a good pivot for all movements necessary in regulating the flow.

I formerly gave the long arm of the filter the same diameter as the short arm. Later I found it better to make the filter in the form shown in Fig. 3, i.e., with the long arm semicapillary. When the diameter of this part of the filter was large, space was given for the mixing of the fluids which passed into it, the order of the liquids obviously having a tendency to become reversed after passing the U-bend of the filter. This gave rise to two difficulties. First, when the filter was reversed on changing to the alternate reservoir, a small backward diffusion took place which was especially inconvenient after dehydrating with absolute alcohol; secondly, the precipitate which occurs when carmine fluids are mixed with alcohols had a tendency to accumulate in a flocculent condition in the long arm of the filter, a fact due no doubt to the diffusion constantly taking place there, and this precipitate sometimes clogged the orifice. Both difficulties are avoided in the new form.

The remedy for clogged orifice may as well be given here. If only the extremity is clogged, break away a little of the capillary part, which should always be long to allow for this emergency, and readjust the flow if necessary. If that procedure be inadmissible, hold the point of the filter for a fraction of a second in a small alcohol flame. The slight explosion which occurs will often remove the obstruction.

As regards the mixtures used in differentiating, I formerly—made them as they were required. I now keep a stock of fluids on hand. My present stock I find to be as follows:—

I.—*The objects are to be mounted uncut in balsam.*

Alcohols of the following strengths:—7%, 15%, 22%, 30%.

Mixture three parts 30% alcohol and one part borax-carmin.

Mixture one part 30% alcohol and one part borax-carmin.

Mixture one part 30% alcohol and three parts borax-carmin.

Borax carmin.

Mixture three parts borax-carmin and one part 60% alcohol.

Mixture one part borax-carmin and one part 60% alcohol.

Mixture one part borax-carmin and three parts 60% alcohol.

Alcohols of the following strengths:—60%, 65%, 70%, 75%, 80%, 85%, 90%, 95%, 100%, acidulated as may be necessary.

Mixture of three parts absolute alcohol and one part clove-oil.

Mixture of one part absolute alcohol and one part clove-oil.

Mixture of one part absolute alcohol and three parts clove-oil.

Clove-oil.

Mixture three parts clove-oil and one part thin balsam.

Mixture one part clove-oil and one part thin balsam.

Mixture one part clove-oil and three parts thin balsam.

Thin balsam.

In all twenty-eight.

II.—*The objects are to be cut.*

Go to absolute alcohol as in I.

Then, mixture three parts absolute alcohol and one part chloroform.

Then, mixture one part absolute alcohol and one part chloroform.

Then, mixture one part absolute alcohol and three parts chloroform.

Chloroform.

Then use Giesbrecht's method or some equivalent one for imbedding in paraffin or all previous precautions against shrinkage will have been useless.

III.—*Alcoholic carmin is to be used.*

Go to 60% alcohol as in I.

Then mixture three parts 60% alcohol and one part Mayer's carmine.*

Then mixture one part 60% alcohol and one part Mayer's carmine.

Then mixture one part 60% alcohol and three parts Mayer's carmine.

Mayer's carmine.

Mixture three parts Mayer's carmine and one part acidulated absolute alcohol.

Mixture one part Mayer's carmine and one part acidulated absolute alcohol.

Mixture one part Mayer's carmine and three parts acidulated absolute alcohol.

Absolute alcohol.

Then the appropriate clove-oil and balsam mixtures.

IV.—*The objects are to be preserved in glycerine.*

Glycerine of the following strengths, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100%.

When turpentine and such other fluids as act on caoutchouc are used, it becomes necessary to use stout caoutchouc tubing and to tie it on firmly.

THE SUCTION-CAPSULE.

The suction-capsule was devised to aid in solving those difficult and important problems connected with the development in the human alimentary canal of the eggs and larvæ of the internal parasites peculiar to man, and incidentally to serve in a similar manner in investigating the internal parasites of the lower animals.

The usual procedure (feeding the eggs to a subject direct and recovering them or the resulting larvæ by killing the subject) is not applicable to man, and is in any case open to some serious objections, especially in certain cases. It is often impossible to

* I make this carmine to contain 80% alcohol and ensure the exact percentage of alcohol by making in a flask immediately connected with a vertical Liebig's condenser. No alcohol is then lost by evaporation during the boiling.

be certain that the eggs or larvae recovered are identical with those administered, and this alone is a serious drawback. With man himself the case stands most precarious. To show this it will suffice to cite one of the best known and most decisive experiments of the kind under consideration. Prof. Rudolph Leuckart, the celebrated Leipzig naturalist, swallowed a number of the eggs of *Oxyuris vermicularis*, the common pinworm or threadworm of man. About two weeks later he passed some nearly mature worms of that species, as it seems did also several of his pupils, who performed the same experiment simultaneously with him. The perfectly obvious conclusion is that the worms noticed were those resulting from the eggs wittingly swallowed two weeks previously, providing the experimenters were previously free from *Oxyuris*. But the proviso seriously mars the result. The more familiar one is with the abundance of the eggs of *Oxyuris vermicularis*, and the multitudinous chances they have unbeknown to him of getting into the alimentary canal of man, the more one will hesitate in admitting that more than a probability was established by Leuckart's experiments. No one could be better aware of this than the renowned author of the "Parasites of Man," and his statements are therefore only those justified by his experiments. Succeeding authors have not been correspondingly careful, and one may find the statement in what seem to be authoritative places boldly made on this very evidence, that the direct development of *Oxyuris vermicularis* has now become certain. Balfour very properly qualifies the "certain" by prefixing "almost."

The suction-capsule will, I hope, lead to a greater amount of certainty in this field.

The idea embodied in the suction-capsule occurred to me two years ago at Jena. At that time I made some experiments with it, but they came to no satisfactory conclusion as the sequel will show. Recently while making some researches into the life-history of certain Australian entozoa I tried it again and this time with most gratifying results.

The suction-capsule is made from thin glass tubing of two to five millimeters external diameter. A capsule adequate for experiments on lower animals is easily made. Connect an ordinary blow-pipe with a filled air-bag and produce a narrow oxidizing-flame by sending a blast from the blow-pipe through the flame of a small alcohol lamp. Heat the glass tubing successively in two places and draw it out into the form shown in Fig. 5. The length of the central capsule, *s*, should not much exceed twice its width. Now break off the tubing at one end of the capsule and heat that end in the blow-pipe flame until the aperture becomes minute, and follow this operation by heating and drawing out the narrow tube at the other end of the capsule into the form shown at *t*, Fig. 6. The glass at *t* will remain tubular. Suppose the minute aperture at *u*, Fig. 6, to be stopped with glue. Then if suction be exerted at *r* and while the suction is being exerted the tube at *t* be melted in a fine-pointed blowpipe flame, the capsular portion will be severed from the remainder of the tube shown in Fig. 6, and will constitute what I call a suction-capsule. (See Fig. 7.) Such a capsule contains a partial vacuum, and has the power under appropriate conditions of exerting suction. This characteristic property is soon observed if the capsule be immersed in water. The plug of glue soon dissolves and water is then drawn into the capsule in quantity proportional to the previous exhaustion of the air. For instance

a capsule which weighed	...	...	108 mg.
on being filled with water weighed	...	...	230 mg.
Hence the capsule was capable of holding	...	...	.122 cc.
After partial exhaustion of the air and immer-			
sion in water the weight was	...	...	150 mg.
Hence the water sucked in weighed	...	...	42 mg.

In other words this suction-capsule when immersed in water sucked itself about one-third full. This completely illustrates the mechanical action of the capsule and it now only remains to say a word about the manner of its use. It is made the vehicle for conveying to the stomach of animals, man included, the eggs of entozoa. On reaching the stomach the capsule takes in gastric

fluids and the eggs are therefore subjected to the action of those fluids, under normal conditions. The capsule is recovered from the faeces in the case of man but in any way desired in the case of lower animals. The results leave little room for the distressing uncertainties often attendant upon simply feeding the eggs. On recovery the contents of the capsule are invariably acid. The inserted eggs are therefore subjected to the action of the gastric fluids only.

The eggs experimented upon are put into the capsule either through the aperture shown at *u*, Fig. 6, before it is stopped with glue, or are introduced through *t* after *u* has been stopped. In this latter case *u* may be made so small that no resulting embryo can escape, a result which may also be secured by tying filter paper over the aperture *u* by means of cloth and a strong fine thread. A pipette may be made with an exceedingly fine capillary neck longer than the distance from *u* to *r*, Fig. 6, and by means of this pipette eggs (in water) inserted into the capsule through *t* after *u* has been stopped. Fusing the capillary part *t* does not heat the capsule sufficiently to injure living eggs.

There is a choice of ways in exhausting the air. One may attach a rubber tube at *r* and by sucking ones utmost thereon produce a sufficient exhaustion. I use a pair of two-quart bottles containing water and connected by a long piece of rubber tubing arranged so that by lowering or raising one of the bottles by means of a cord and pulley a variable pressure or suction can be exerted at will. I have not found it expedient to reduce the pressure in the suction capsule to less than three-quarters of an atmosphere, an effect which one can barely produce with no other pump than one's own lungs.

Capsules varying from 1 millimetre to 4 millimetres may be easily fed to many animals and a little ingenuity will succeed in introducing them almost anywhere desired. I have repeatedly swallowed such capsules and have never experienced any inconvenience beyond a nervous anxiety at the first trial.

As a small proof of the usefulness of both the instruments here described, I accompany this paper by another entitled, "Oxyuris-larvæ hatched in the human stomach under normal conditions."

EXPLANATION OF THE FIGURES.

- a.*—Reservoir used in transferring to lighter fluids.
- a'*.—Reservoir used in transferring to heavier fluids.
- b.*—Object-box, or object-cylinder.
- c.*—Filter.
- d.*—Short piece of glass tubing.
- e.*—Patch of finest linen.
- s.*—Capsule.
- t.*—Capillary neck to capsule, fine to be fused.
- u.*—Mouth of capsule stopped with glue.
- v.*—Plug of cotton.

Fig. 1 and 2.—Differentiator, one-fifth convenient size, with the three parts (*a*, *b*, and *c*) joined in place by caoutchouc tubing.

Fig. 3.—Object-box (*b*), and filter (*c*), full size, showing the best form of filter.

Fig. 4.—Object-box, full size, showing best method for securing minute objects.

Figs. 5 and 6.—Two stages in the process of making a suction-capsule.

Fig. 7.—Suction capsule ready for use, magnified ; seen in section.

OXYURIS-LARVÆ HATCHED IN THE HUMAN
STOMACH UNDER NORMAL CONDITIONS.

BY N. A. COBB.

(Plate VIII.)

In spite of the fact that *Oxyuris vermicularis*, the common pinworm or thread-worm parasitic in man, is the Nematode that has been longest known and is the one that comes most frequently under the notice of physicians and helminthologists, its life-history has remained incompletely solved. In this respect it is simply illustrative of nearly all the entozoa inhabiting man. It is, for the most part, only by the slow accumulation of occasional bits of evidence, obtained largely by what may be termed accident, that the life-histories of these terrible pests have been brought to their present more or less incomplete state. Pending further observations existing gaps are filled in by more or less probable conjecture.

Oxyuris vermicularis, it is well known, inhabits the large intestine of man, occurring not seldom in thousands, smaller numbers being found in a very large percentage indeed of the subjects for post mortem examination. The worm is not confined to any particular period of life. Though most common in children, scarcely any of whom remain between the ages of two and eight completely free from *Oxyuris*, it is not less than frequent in older people, even including those of extremely advanced age. Its constant presence and the suffering thereby frequently caused, especially in children, where it often leads to extreme nervousness and irritability to say nothing of its annoying evening attacks, has led to much investigation which is recorded in a literature so abundant as to be equalled by that of but few animal species. Where investigation has failed to throw sufficient light, speculation has stepped in and rendered good service in the labour of completing a rational life-history.

It has been found that both sexes of this parasite inhabit the human intestine in about equal numbers.* They reach there their full size, feeding upon the contents of the intestine, and the females produce and lay eggs which may be found in almost every particle of the excrement of persons suffering from an attack of Oxyuris. The adult females have a tendency to wander to and outside of the anus, especially at evening, probably for the purpose of laying their eggs. It is these females which cause the itching sensation peculiar to attacks of "pinworms." If the offending worms be artificially removed they are invariably found to be adult females having their sexual organs distended with eggs which they begin to deposit immediately on exposure to the outer air.

It was when we came to the fate of the eggs that uncertainty prevailed. It was held on the one hand that the eggs hatched and developed only in the large intestine, and the entire cycle of life thus completed in the birth-place. Holding this view, Vix contended that a person once infected with Oxyuris might remain so indefinitely. On the other hand, and as we shall see with better reason, it was contended that the eggs hatched normally only on being introduced into the human stomach.

Those holding the first view based their belief on the occurrence side by side in the same intestine of all the stages in the development—eggs, larvæ, and adults. At first sight this seems plausible enough, but further thought shows that the same facts support the second view to an extent almost if not quite equal.

* Leuckart and many others state that the females are more abundant than the males, and Leuckart gives as the result of his investigations the ratio 9:1. Devaine however believes the males to be as abundant as the females and I will add a case supporting his view. I took the entire mass passed from thoroughly purging a case of Oxyuris and poured it into hot corrosive sublimate solution, shook immediately and violently, and then examined the whole precipitate most carefully under a powerful magnifying glass, with the best illumination. Being practised in searching for much smaller free-living Nematodes, treated in a similar manner, I am confident that none or almost none escaped the scrutiny. The result was 49 males and 52 females.

Furthermore, it was possible to adduce in favour of the second view and against the first the following weighty considerations :—

1. The eggs found in *feces* are generally in the first stages of development.

2. Such a mode of development as is supposed in the first view would constitute an exception to the general rule for the development of all entozoa, which is that the eggs or larvæ pass out to develop, to some extent at least, outside, and then to find, after a more or less chequered career in the course of which they may live for a time in a species different from that inhabited by their adults, a new host of the original kind.

3. Investigators who were generally free from *Oxyuris* having swallowed its eggs passed nearly mature worms after about two weeks.*

4. The larvæ have been found in the duodenum and small intestines.†

5. Life-histories consonant with this second view have been more or less perfectly established for some of the other species of the genus *Oxyuris*.‡

In fact these considerations have been thought by some to be sufficiently weighty to warrant the assertion as an established fact that the eggs of *Oxyuris vermicularis* first hatch on being introduced into the human stomach, and that the larvæ on reaching the large intestine remain there to maturity. Such an assertion is, however, not warranted by the above enumerated considerations.

This incomplete state of our knowledge concerning the development of the *Oxyuris* of man led me to perform some experiments. I placed twelve eggs of *Oxyuris vermicularis* in a suction capsule,§ sealed and partially exhausted of its air, and

* Leuckart, "Parasiten d. Menschen."

† Zenker, "Verhandl. der physik. med. Soc. zu Erlangen," 1872.

‡ Balfour, "Comp. Embryology," Vol. I.

§ For description see "Two new instruments for biologists." Cobb, Proceed. of Linn. Soc of N.S.W., 1890, p. 157.

swallowed it. This capsule for some reason I never recovered, and this fact led me to abstain from repeating the experiment until it became certain that no evil effects resulted. After waiting about a year I became convinced that in the disagreeable search for the capsule I must have overlooked it. In my second experiment therefore I took precautions to insure an early recovery. Obtaining at last a fresh supply of eggs, I swallowed another similarly prepared capsule after having partaken of a liquid dinner. This was at 7 p.m. At 2 a.m., I took a dose of castor oil, and at 7 a.m., recovered the capsule by means of a long handled paint brush and a sieve whose meshes were just small enough to intercept the capsule. On breaking the capsule I found the embryos hatched and in active motion. The eggs used in this experiment were *freshly laid* and contained embryos in the so-called tadpole stage. The results of this experiment led me to make a third, in which I used a large number of eggs containing fully developed and, when warmed, actively moving larvæ. This third capsule was swallowed at 10½ p.m., and recovered, by purging, at a little before 4 a.m. It remained in the alimentary canal in all less than six hours. On opening the capsule on a warm stage I received a large number of actively moving larvæ which I at once killed, a part with hot solution of corrosive sublimate and the remainder with $\frac{1}{10}\%$ osmic acid and brought respectively into Canada balsam and glycerine by means of the differentiator.* The results of experiments two and three I will now detail in full.

Experiment II.

Nearly all the eggs used (12-13) hatched. Most of them had undergone some development, more in fact than the remaining eggs out of the same lot which lay meanwhile in the dead and dry female worm, but not so much as might have been expected. The

* For description see "Two new instruments for biologists," Cobb l.c. Also British Association for the Advancement of Science, "Report (1889) on the Zoological Station at Naples."

largest of the hatched larvæ did not much exceed 0.11 mm., while the smallest had hardly developed beyond the tadpole stage at which they were inserted. Thus it will be seen that it is not necessary that the eggs of *Oxyuris vermicularis* should undergo any considerable development outside the body of its host, though normally they do so without a doubt. What would have been the fate of these smallest larvæ no one can tell. I believe they would if left free in the alimentary canal have lived and developed. The cuticula was already well-formed, and, with the very highest powers, visibly transversely striated.

A comparison of the unhatched specimens with the empty shells proved that the embryos escape from the egg in a uniform and definite way. I already knew of the existence of pores in the shell of the eggs of this species of *Oxyuris*. I discovered them while attempting to rear the larvæ from eggs kept in artificial digestive fluids,* in which attempt I failed. I found, however, that after about twenty-four hours at body temperature the artificial digestive fluids brought to view distinct pores in various parts of the shell. The distribution of these pores seemed to me at the time quite irregular, and I never saw more than two or three in close proximity. I overlooked entirely a phenomenon which was first brought to my notice by experiment two here described, namely, *the existence of a distinct area (Pl VIII, Fig. 1), where these pores are very numerous and which becomes the place of exit of the embryo.* I was first made aware of this fact on comparing with each other the empty shells from which embryos had made a normal exit. These empty shells were without exception ruptured at the same place. To locate this place accurately it will be necessary to describe the egg. The eggs of most species of *Oxyuris* are more or less irregularly spindle-shaped. The irregularity consists in a curvature of the long axis in the dorso-ventral plane of the future embryo. Furthermore, the two rounded ends of the egg are dissimilar, the anterior end, speaking again from the position of the future embryo, being more pointed than the posterior. When therefore the egg is viewed in profile, and this

* Lactopeptine and other proprietary preparations.

is the view generally obtained under the microscope, it presents a nearly straight ventral and a decidedly arcuate dorsal contour, the anterior end being evident from its pointedness. At the anterior end, then, and on the dorsal surface of the shell of the egg of *Oxyuris vermicularis* is a circular area whose structure is not uniform with that of the remainder of the shell, and which is destined to give way for the passage of the embryo on its issuing from the egg (Pl. VIII, Fig. 1). Now that I have demonstrated its existence I have no difficulty in seeing this structure at any stage after the formation of the shell, though *through the action of the gastric fluids it very soon becomes much more apparent* as a porous area. Whether the pores exist previous to the action of the gastric fluid or are a result of its action I cannot positively state. I believe, however, that something like the former is the case and that the porosity becomes more apparent as the stomach fluids continue to dissolve this part of the shell, which ultimately becomes so weak that the movements of the embryo cause it to give way.

The embryo seems to issue uniformly tail first.* A fully formed embryo is doubled upon itself twice, the posterior bend being situated at the anterior end of the egg. It is this posterior bend that issues first, followed by the tail, and finally the head.

Whether the above described area will be found to bear any relation to the ovarian history of the eggs and the entrance of the spermatozoa remains to be seen. It seems to me not improbable that a connection may exist.

Experiment III.

All the numerous eggs used in this experiment contained fully developed embryos, *nearly all* of which became hatched inside of six hours, proof enough that *quick advantage is taken by Oxyuris vermicularis of a chance to establish itself in the human alimentary canal*. A goodly amount of gastric fluid entered the capsule, and the results must be regarded as quite

* I speak here from later observations.

normal. The shells did not become dissolved, though they all became somewhat rounder (i.e., wider and shorter) and thinner. In neither of the experiments two and three did I notice the pores scattered here and there over the whole surface of the egg as was the case when I subjected some eggs to the action of artificially prepared digestive fluids.*

The larvae are of the form shown in Fig. 2. The average length is 0.155 mm.; the bottom of the mouth cavity or pharynx is distant 1% the nerve-ring 12.4%, the posterior end of the œsophagus 33.1%, and the anus 78.4% of the length of the animal from the anterior extremity; the diameter opposite the base of the pharynx is equal to 3% opposite the nerve-ring to 6.8% opposite the posterior end of the œsophagus to 6.8% opposite the middle of the body to 5.7% and at the anus to 3.2% of the entire length of the animal, dimensions which may be conveniently expressed by the formula

$$\begin{array}{ccccccccc} 1 & & 12.4 & & 33.1 & & M & & 78.4 & & \\ \hline 3 & & 6.6 & & 6.8 & & 5.7 & & 3.2 & & \cdot 115 \end{array}$$

in which the figures above the line represent lengths and those below the line represent *corresponding* diameters, expressed in such a manner that the unit of measurement is *one per cent. of the entire length*.† The *porus excretorius* is situated 31.2% of the length from the anterior extremity. The head is rounded, the tail conoid. I believe that the sexes are already distinguishable and that Fig. 2 represents a male. The females diminish in diameter very uniformly from the œsophagus backward, while the males have the tail contrasted by a sudden decrease in diameter in the preanal region as is shown in the figure.*

* The eggs used in those experiments were obtained in Germany, where I was then residing, while those for experiments two and three here described were obtained from Australian subjects, facts which may possibly account for the difference.

† A method of expressing the dimensions of Nematode worms which I have found extremely convenient, the formula recording in itself sometimes all that is necessary to characterize the species.

* If this distinction between the sexes holds good, it follows as a corollary, according to my observations, that the sexes are born in about equal numbers. I made no count, but no great inequality could have existed without my noticing it.

Cuticula.

Concerning the cuticula I have little to say beyond stating that it is composed of three layers and exhibits under the highest magnification fine transverse striæ. There is no indication of the future cuticular growth at the head unless two large cells, one placed dorsally and the other ventrally, be so considered, and I am doubtful if that can be done. These cells are pointed out at *d, d*, Fig. 2. On the other hand the wings are to be distinctly seen and apparently extend from one end of the larva to the other.

The Alimentary Canal.

The mouth is as yet unprovided with distinct lips. The saucer-shaped mouth-cavity leads to an œsophagus which is most appropriately likened to that prevailing in the genus *Rhabditis*, that is to say the anterior half, which is swollen at its posterior extremity, is connected by a narrow passage with an elongated-ellipsoidal posterior bulb. This bulb sometimes does and sometimes does not show traces of the future valvular apparatus. The swelling at the posterior extremity of the anterior half of the œsophagus seems to me to have the signification of a bulb, but while the posterior bulb is composed of numerous small cells, this median bulb, as I will term it, is composed of about six large elongated cells whose long axes lie in the direction of the œsophagus. In the remaining parts of the œsophagus the cells present large elongated nuclei. The intestine, at first narrow, gradually widens to the middle of the body, where it has a diameter one-third as great as that of the body itself, and then continues with a uniform width until near the anus, where it presents a broad constriction similar to that figured by Galeb* for the larvæ of some species of *Oxyuris* parasitic in insects. I do not think that this constriction corresponds to the beginning of the rectum. I am not certain what its signification is. I have observed an

* "Organisation et développement des Oxyuridés." Arch. d. Zool. Exp. VII. 1878.

exactly similar constriction in the intestine of the larvæ of *Rhabdonema nigro-venosum*. One is reminded of the peculiar formation of the posterior part of the intestine in *Dorylaimus*, without however receiving thereby any elucidation of the present structure. What I regard as the true rectum is narrow and has a length not exceeding that of the anal diameter. There seem to be several one-celled glands around the rectum. Where they empty I cannot say. In the larvæ of *Oxyuris obvelata*, the *Oxyuris* of rats and mice, I have seen corresponding one-celled glands and am certain that they empty by long narrow ducts into the rectum at its middle.

Muscular System.

Observations on the muscles were unsatisfactory. The muscle-cells were distinctly visible and the system seemed to be that of the Nematodes called by Schneider* *Polymyariæ*. The adult *Oxyuris* belongs to his *Meromyariæ*.

Reproductive Organs.

The cells destined to give rise to the reproductive organs lie in the ventral part of the body cavity somewhat behind the œsophagus. (s, Fig. 2.)

Jugular Cells.

Under this non-committing name I call attention to some cell-masses in the neck of the larva. I think there are three such masses. They may have some connection with the nervous system. (j, Fig. 2.)

Nervous System.

The nerve-ring is not easily discovered. From a large number of observations, however, I have been enabled to determine its position, as will be seen by the figure and the formula. It encircles the œsophagus considerably in front of the median bulb, and, like the nerve-ring in the adult worm, is not in the least oblique. (Fig. 2, n.)

* "Monographie der Nematoden," &c.

Excretory System.

I have reserved this system until the last because I have the most to say concerning it. It consists simply of a one-celled gland emptying ventrally opposite the posterior bulb of the oesophagus by means of a short and narrow duct. (Fig. 2, v.) Its form strongly reminds one of the ventral excretory organ as it exists in a large number of free-living Nematode genera. Its position, however, alters rapidly with the growth of the animal, becoming situated in the very first stages of larval growth quite behind the oesophagus. Its later history I do not know from observations on *Oxyuris vermicularis*, but in *Oxyuris obvelata* it is as follows: It exists at first in the form here shown for *vermicularis*. It rapidly increases in size posteriorly and becomes bifurcated. Each of the branches moves to the adjacent lateral region and becomes attached to the lateral field thereof, continuing all the while to increase posteriorly. (Figs 3, 4, 5.) It thus gives rise to the two lateral ducts which are so often described in Nematodes as uniting and emptying ventrally through the *porus excretorius*.

It seems to me that much confusion with regard to the excretory system of Nematodes has arisen in a very natural way. The oft-mentioned lateral ducts or lateral vessels were first discovered in some of the larger parasitic forms (*Ascaris lumbricoides*, &c.), and were afterwards found to exist in many parasitic species, being sometimes imbedded in the substance of the lateral fields. The nature of these vessels was at first uncertain. They were held by some naturalists to constitute a circulatory system, but by others were regarded as part of a water-vascular system. The fact that these vessels almost universally emptied through a single ventral opening of small dimensions gradually led to the opinion, solely on morphological grounds however, that the two vessels were excretory in their function. The small ventral pore was given the name of *porus excretorius*. The connection with the lateral fields led however to a very natural morphological error, namely the opinion that

the lateral vessels constituted a fundamental part of the lateral fields, the latter coming therefore to be regarded as perhaps also excretory in their function.

Several facts have long since come to light which render this position untenable. In the first place it was found that the lateral vessels were not always present on both sides. The number of species possessing but one lateral vessel has gradually increased until, in the important genus *Ascaris* at least, two vessels can hardly be said to be the rule. When, however, only one lateral field has a vessel connected with it the other lateral field remains, except for the disappearance of the vessel, essentially unaltered, something not to be expected if the connection between vessel and field was in any way intimate. In the second place submedian fields exist, hardly to be distinguished in structure from the lateral fields, and in connection with these submedian fields no vessels have ever been seen. In the third place the connection between the vessels and the fields though in some cases apparently intimate is in many cases manifestly slight.

Still when it became gradually established through the researches of Eberth, Bastian, Bütschli, Von Linstow and De Man that the existence of a unicellular gland emptying through a ventral pore was of very general occurrence among free-living Nematodes, so firmly had the idea of lateral vessels in connection with lateral fields taken hold that the homology of the newly discovered unicellular organ with the long known lateral vessels was not recognized and it remains to day very incompletely acknowledged.

The homology is I believe complete. Once set up a disconnection between the lateral fields and the lateral vessels and the homology is much more easily recognized. Reasons for holding the connection which does actually exist as of no great significance have been enumerated above. This connection may have, nay probably has, been brought about quite mechanically. The Nematode worm from the beginning undulates its body in a dorso-ventral plane and this movement is an important factor in the development and position of the organs, and to it is probably due the position of the long lateral vessels of the large parasitic

species. The connection seldom reaches that state in which it became early known in *Ascaris lumbricoides*, where the vessels are actually embedded in the substance of the fields. More often the vessels are simply attached to the fields by connective tissue, in which case all cross-sections emphasize the fact that the connection is mechanically wrought and of no deep significance. This is strikingly the case for instance in sections of two species of *Ascaris* whose structure is well known to me, *Ascaris Kükenenthalii* from whale and *Ascaris bulbosa* from seal of the Arctic Ocean.*

Granted that the connection between the lateral fields and the lateral vessels, intimate as it sometimes seems, is as it were accidental, we have, in order to prove the homology of the vessels with the one-celled ventral organ of the free-living Nematodes, only to reconcile the duplex nature of the vessels with the more simple nature of the unicellular gland. This can be very conclusively done. In the first place it is to be observed that it remains to be seen whether a duplex form of this organ does not occur among free-living forms. I think there is reason to believe that it exists there and is perhaps even not uncommon. In the second place it is to be observed that in the large parasitic worms the organ is often, to say the least, single. In the third place the large size and consequent different shape of the organ in the parasitic Nematodes simply accords with their larger size. Should a typical free-living Nematode three to four inches long ever be discovered I should be surprised to learn that the ventral gland was a unicellular organ of the form familiar in *Oncholaimus* and other free-living genera. In the fourth place, and here we return to our *Oxyuris* larvæ, it seems that the development of the organ in the parasitic species is such as to set the matter quite at rest, if we trust ontogenetic evidence. The full grown excretory organ in the genus *Oxyuris* is well known to consist of four vessels originating in a ventral ampulla and extending two forwards and

* Cobb, "Beiträge z. Anatomie und Ontogenie d. Nematoden," *Jenaische Zeitschrift*, XXIII. Bd. N.F. XVI.; also *Archiv für Naturgeschichte*, I. B., 2 Heft, 1889.

two backwards, along the lateral fields. But the young larvae of *Oxyuris vermicularis* and *obvelata*, as I have shown, possess the organ in the form now so well known among free-living Nematodes. By increasing with the growth of the larvae and becoming bifurcate the simple unicellular form gives rise to the larger, later and more complicated system of vessels.

I have dwelt at some length upon this matter because in the Nematode literature as a whole there lurks a suspicion that the two structures so often mentioned in the preceding paragraphs, the lateral vessels and the lateral fields, are in some way intimately connected with each other, and as a kind of corollary that the lateral fields may be excretory in their function, a suspicion which seems to me groundless. I will add that I have tested the lateral vessels of *Ascaris lumbricoides*, the large stomach-worm of man, to ascertain the nature of their contents, and have proved the presence of urea and sodium chloride, weighty evidence in favour of regarding the vessels as excretory organs. Until now the evidence supporting such a belief has been solely morphological. Schneider failed to find uric acid in the vessels of *Ascaris marginata*. I also failed to find uric acid in the vessels of *A. lumbricoides*, but should not deny its presence without first making further tests. I shall give the details concerning my tests and methods at another time, when I can accompany them by the results of further experiments now in progress.

Phylogenetic.

In three respects *Oxyuris vermicularis* seems to differ considerably from the majority of the species of its genus. These are, the peculiar structure of the head, the position of the nerve ring and the position of the *porus excretorius*. In all these respects, the larva stands nearer the average *Oxyuris* than does the adult, showing that in these particulars *vermicularis* is a departure from the type of the genus.

Does the structure of the larva of *Oxyuris* throw any light on the ancestry of the genus? A glance at Fig. 2 tempts one to hazard an answer in the affirmative. The striking resem-

blance existing between the adults of the two genera *Oxyuris* and *Rhabditis** have been often remarked. So long as the adults only are considered the resemblances are open to either of two interpretations.

1. The resemblances may be due to a close genetic relationship.
2. They may be due to the reaction of the environment, which is to some extent similar for the two genera.

In the latter case a close genetic relationship is supposed not to exist, and no very striking resemblance would be expected to obtain at any period of life on which the selective influence of the environment had not been exerted. The embryonic life is probably that on which the environment would have least influence. Consequently if the embryos of *Rhabditis* and *Oxyuris* resemble each other, or if the similarity between the average mature form of either of these genera and the embryos of the other be greater than that between the adults of the two genera, we should be justified in preferring the first interpretation. In either case we naturally appeal to the ontogenetic evidence before us. If the first interpretation be the true one, a study of the development would betray the relationship, which should be one of the following :—

1. The one genus a direct or indirect derivative from the other.
2. Both genera separate derivatives from an older form.

In the latter case the successive developmental phenomena of the two forms should diverge. In the former case, the natural supposition being that *Oxyuris* is the younger group, the larvæ of *Oxyuris* should have greater affinity with *Rhabditis* than have its adults.

Now this seems to be the case. Our figure represents an œsophagus for instance which is much more *Rhabditis*-like than the œsophagus of the adult *Oxyuris*. The median swelling containing the large cells must, I think, be interpreted as a bulb, and it is at this point that a bulb or something like

* In the discussion which follows I have in mind also the allied genera *Diplogaster*, *Anguillula*, *Cephalobus*, &c.

it is usual in *Rhabditis*. The pharynx is open, though it is already less like the pharynx of *Rhabditis* than it was during the tadpole stage, when it was deeper and cylindroid, constituting one of the striking features of the embryo. The nerve-ring has not the position usual in *Rhabditis* (behind the median swelling), but approaches it much more nearly than does that of the adult *Oxyuris*. Finally, the *difference between the sexes which already exists in the larval state** points to a deep-rooted tendency toward an early degeneration of the male tail, something which finds a ready explanation in supposing the sexes to have been unlike in the ancestors of *Oxyuris*. Now the sexes are more unlike in *Rhabditis* than in most free-living genera, but its larvae do not show so early or so striking a sexual differentiation as is to be seen in *Oxyuris*.

If these considerations are as weighty as they seem (to me) to be, we are justified in deriving *Oxyuris* directly from some part of the group of *Rhabditis*-like free-living forms.

Contagion.

The world-wide common occurrence of *Oxyuris vermicularis* points to an efficient method of distribution. The method is simplicity itself. The 20,000 eggs which at a moderate calculation each adult female contains are laid either in the large intestine to pass out with the excrement or are laid just outside the anus. They become distributed over the person, clothing, bed-clothing and other articles of furniture, of the infected, and in excrement are sown broadcast over cultivated lands. They then find their way to the mouth, mostly by way of the hands, less commonly by other agencies, are swallowed, hatch promptly in the stomach,† and on reaching their proper habitat, the colon, are prepared to hold their place there until maturity.

The abundance of the eggs about dwellings, &c., is difficult to

* True also of the larvae of some *Oxyurids* inhabiting insects. See Galeb, l.c.

† This link in the history was first established by the experiments just described.

overstate, and is easily illustrated by a calculation. Reckoning fifty female worms to the individual, an average which I am certain is exceeded in many localities, we have for a population of 250,000, the enormous number of two hundred and fifty thousand million eggs, which if distributed evenly over twenty square miles would furnish *four to five hundred eggs to the square foot*. They are, however, not distributed uniformly. They are most abundant in the fæces and on the persons of the infected—i.e., about the anus, under the nails and on the clothing. Thence we may trace them in ever decreasing abundance through wash- and bathing-water, &c., to a more general distribution,—facts so well-known that I need only state them.

Whatever moves and comes in contact with the eggs is likely to transport them from place to place. Animals, especially flies,† currents of water, currents of air carrying dust, all become agencies in disseminating these minute eggs.

†On another occasion I have written concerning flies as follows:—

“Nor are these latter agencies such remote causes as might at first be supposed. It is well known that birds are great travellers, but at certain seasons they are outdone by flies. They are, no doubt, in Sydney to-day hundreds of flies that were born and brought up in Melbourne. This is no rash statement. I know of some that arrived in the Iberia; and they arrive by every train from points more or less distant. I have had an individual fly under observation for a hundred miles (Springfield to Boston, Mass.), and often for shorter distances. Some flies shut into the waggon with me one evening in Dresden arrived safely in Berlin at midnight, and I have no doubt flew out when the cushions were dusted next morning. Steamers several days at sea generally lose these unwelcome passengers, but I have seen flies on a vessel in mid-ocean, thousands of miles from her last port.

“But, aside from being conveyed by artificial agencies, these little beasts are no mean navigators of the air. They can fly as fast as a horse can trot, and that for long distances. I have known them to arrive promptly at a vessel anchored above a mile from any object that would afford an alighting place. I have set loose numbers of marked flies, and shortly afterwards recaptured some of them at my neighbours' houses.

“Do they carry typhoid germs? Doubtless. Darwin found 537 seeds to have existed in three teaspoonfuls of ordinary pond-mud taken at random, and suggested that hastily flushed water-birds carrying such mud on their feet must become distributors of such seeds. A fly is just as capable of carrying disease germs as a duck of carrying Juncus seeds.

“I can advance no instance in which flies have been known to carry typhoid germs, but that they carry about on their feet much larger objects, namely, the spores of common mould, I have repeatedly observed. The mould-spores are not large objects, are in fact invisible. Still a sufficiently

184 OXYURIS-LARVA HATCHED IN THE HUMAN STOMACH.

To exclude *Oxyuris* it is only necessary to exclude its eggs. Unfortunately the minuteness and abundance of these latter render their complete exclusion difficult. They gain access easily by means of such vehicles as air, food and drink—how easily will be best inferred by glancing at the ensuing list of possibilities.

The eggs arrive at the hands

If directly, then from the person of the infected (hand-shaking, &c.)

If indirectly, then

By handling soiled clothing.

By usage in common with the infected of the same articles (household and office furniture, public conveyances, &c., &c.).

The eggs arrive in the mouth

From putting the fingers in the mouth.

From biting the nails.

From putting handled articles between the lips or teeth (pens, pencils, pins, money, stamps, gloves and a hundred other things).

From washing the face and hands in the same water.

From use of any of the numerous edibles, &c., which come from the market after indiscriminate handling and exposure and are then eaten uncooked. Especially to be mentioned are

Butter.

patient and skilful person can isolate one and plant it as accurately as a gardener plants a pumpkin seed. It was while making some experiments of this kind that I caused a fly to walk over a glass sprinkled with mould-spores and then over some freshly prepared gelatine in a dish near by. Next day the fly's footprints could be read on the gelatine in visible mould. At each step the little creature had deposited spores which during the night had germinated. Microscopical examination revealed spores on the fly's feet.

“That the house-fly is an agent well calculated to promptly transfer the dreaded fever germs to our food and drink is only too clear. It frequents for the purpose of laying its eggs the very places (water-closets, &c.) where the germs are most likely to be found. That it returns promptly from thence to feed upon fruit and other food in too many kitchens, in too many shops, and on too many dinner-tables requires no proof.”

*Confectionery.***Vegetables and fruit eaten raw.**Bread, cakes and pastry.**Cigars and cigarettes.**From table utensils (napkins, toothpicks, &c.).**From drinks.**From breathing dusty air (clouds of dust on the streets,
dusty air when clothing or carpets are dusted).*

EXPLANATION OF PLATE.

- a.—Anus.
- b.—Posterior bulb of the oesophagus.
- c.—Constriction in intestine.
- d.—Two large cells at the head.
- e.—Ampulla.
- f.—Margin of the lateral field.
- i.—Intestine.
- j.—Jugular celis.
- l.—Muscle cells.
- m.—Median bulb.
- n.—Nerve-ring.
- o.—Mouth.
- p.—Porous area on the egg.
- s.—Sexual organs.
- t.—Cuticula.
- v.—Ventral gland,

Fig. 1.—Anterior extremity of the egg of *Oxyuris vermicularis* in optical section, showing the position of the porous area. $\times 1300$.

Fig. 2.—Larva of *Oxyuris vermicularis*, not yet six hours old, hatched under normal conditions in the human stomach. $\times 900$.

Figs. 3, 4, and 5.—Different stages in the development of the excretory organ of *Oxyuris obvelata*. Highly magnified. Fig. 5 shows the gland bifurcated.

* There is a common belief that confectionery eaten freely is productive of thread-worms. Confectionery being often more or less sticky is very well adapted to carry the eggs, but the worms which become troublesome soon after its consumption are not a direct but an *indirect* result. Eaten in undue quantity sweets cause acidity from which the worms flee, soon making their appearance near the anus and becoming troublesome. They are worms that were already present,—were not imported with the sweets.

DESCRIPTIONS OF HITHERTO UNRECORDED
AUSTRALIAN PLANTS,

BY BARON VON MUELLER, K.C.M.G., M.D., Ph.D., F.R.S.

(Continued from page 22.)

MUSGRAVEA, g.n.

Flowers small, in spike-like racemes, nearly straight before expansion. Petals separately seceding. Stamens inserted near the summit of the petals. Free portion of filaments very short. Anthers apiculate. Hypogynous scalelets usually three, somewhat distant from each other, upwards gradually pointed. Style capillary. Stigma terminal, conical-ovate. Ovary sessile; ovules two, laterally attached, their base free. Fruit comparatively large, dimidiate-orbicularly ellipsoid; pericarp hard, anteriorly dehiscent.

MUSGRAVEA STENOSTACHYA

at last flatly expanding. Seeds unknown. This new genus differs from *Darlingia* in bracts, number of hypogynous scalelets and ovules, also possibly in the structure of its seeds. Should however normally four ovules be occurring, a question which could not be finally ascertained from the material hitherto extant, and should the seeds not be very different from those of *Darlingia spectatissima*, then our new plant would constitute a second species of that genus. But the pericarp is more like that of *Cardwellia*, while the flowers are nearly those of *Helicia*, seemingly also as regards ovules. The leaves are almost undistinguishable from those of *Orites fragrans*. The dedication is chosen to do also phytographically honour to the memory of Sir Anthony Musgrave, G.C.M.G., the late Governor of Queensland, under whose vice-regal administration those regions became largely opened up, in which this rare and remarkable tree has its native sylvan home.

EREMOPHILA BATTII, n.sp.

Branchlets as well as the leaves beset with very short spreading rigidulous hairlets; leaves quite small, scattered, mostly from rhomboid to lanceolate-cuneate, gradually narrowed into their petioles, generally indented at and towards the summit; flowers axillary, solitary, on very short pedicels; calyx bearing scattered spreading hairlets, its outer segments lanceolar-ovate, its inner narrow-lanceolar; corolla about thrice as long as the calyx, bluish, outside imperfectly beset with jointed spreading hairlets, inside partially cottony, its two upper lobes short and blunt, its lateral lobes semilanceolar-ovate and oblique, the lowest lobe usually roundish and at the base contracted; stamens enclosed; ovulary bearing short white vestiture; fruit comparatively large, nearly globular, beneath the outer pellicle each of its two cells subdivided and two-seeded.

Near Eucla; J. D. Batt.

Leaves $\frac{1}{4}$ to $\frac{1}{2}$ inch long, often longitudinally folded inward, the denticles conspicuous and mostly deltoid. Corolla about $\frac{1}{4}$ -inch long. Ripe fruit measuring fully $\frac{1}{3}$ -inch; the grey

seceding pellicle beset with copious minute hairlets; putamen thick, hard, broadly furrowed.

This species approaches *E. Goodwinii* as regards flowers, but the vestiture is not conspicuously glandular, the leaves are in form and length very different, while the pedicels are much shorter than the calyx. The remarkable indentation of the leaves is not known in any other species.

HALGANIA GUSTAFSNI, n.sp.

Vestiture consisting of copious soft comparatively long hairlets; leaves flat, mostly elliptic-lanceolar, equally green on both sides, irregularly and minutely denticulated towards the upper end, their lateral venules only slightly spreading, cymes usually many-flowered, terminal and from the upper leaf-axils; flowers relatively large; calyx about as long as the corolla, its segments semilanceolate-linear; lobes of the corolla rather conspicuously narrowed at the upper portion; anthers pale-yellow, beset with minute asperities and very small hairlets, the appendages shorter than the cells; style glabrous.

Near Mount Hale.

Leaves hardly rigid, to 2 inches long, often $\frac{1}{2}$ -inch broad, at least the upper sessile. Corolla nearly glabrous, spreading to about $\frac{3}{4}$ -inch diameter. Ripe fruit not obtained. This plant differs already from *H. solanacea* in still more conspicuous indument, in much larger, more denticulated and very venulated leaves, in flowers of greater size and copiousness, in the upwards much narrowed calyx-lobes and in proportionate shortness of the anther-appendages. The species furthermore is distinguished from *H. Bebrana* by not conspicuously glandular vestiture, by leaves more wrinkled on the surface and by more elongated calyx-lobes. *H. integerrima* in its typical state has been found by Mr. Edwin Merrill near Mt. Moore; its leaves are occasionally denticulated towards the summit, its flowers are not seldom solitary; Drummond's plant n. 96 differs, at all events as a variety, in its vestiture. *H. corymbosa* extends to the Greenough River (Miss Duncan).

STUDIES IN AUSTRALIAN ENTOMOLOGY.

NO. III.—ON *PROMECODERUS* AND CLOSELY ALLIED GENERA (CARABIDÆ).

BY THOMAS G. SLOANE.

In the present paper I deal with those species of the carabideous subfamily BROSCINI which are grouped under the genera *Promecoderus*, *Cerotalis*, and *Adotela*. The species included in these genera number at the present time 58 species, of which I am able to notice 35 from actual observation. Future collecting will undoubtedly greatly add to the numbers, and probably some new and remarkable species will be found in the interior of the continent.

Following the classification adopted by Drs. Le Conte and Horn in their "Classification of the Coleoptera of North America," (Washington, 1883,) we find that the *Carabidæ* fall into two great divisions:—

- (1) Those in which the epimera of the mesosternum reach the middle coxæ..... *Carabinae*.
- (2) Those in which the epimera of the mesosternum do not reach the middle coxæ, which are thus entirely inclosed by the mesosternum and metasternum..... *Harpalinae*.

To the second of these divisions the subfamily BROSCINI belongs. Briefly the BROSCINI are distinguished by having the body pedunculate, the scutellum in the peduncle, the elytra without a border on the base, the hinder marginal punctures of the prothorax always considerably in front of the basal angles, a single puncture above each eye; and by the presence of a suture or ridge, more or less distinct, on the sides of the head and extending backwards below and behind the eyes. M. Putzeys in his monograph of the BROSCINI (Sett. Ent. Zeit. 1868) seems to have been the first to notice this feature; he terms it the "suture temporale." By Le

Conte and Horn it is called the "sub-ocular ridge," and concerning it they say (*l.c.* p. 49), "This ridge is well marked in the Cicindelidæ but has not been observed elsewhere [than in the Broscini] in Carabidæ." I prefer to call it the *temporal ridge*.

The Australasian Broscini may be divided into two main divisions by the aid of this feature.

I. Temporal ridge very indistinct, or *incomplete*.

II. Temporal ridge distinct, or *complete*.

In the first division come the genera *Mecodema*, *Metaglymma*, *Percosoma*, *Lychnus*, *Oregus* and *Brullea*, and a new genus which is required for *Mecodema blagravi*, Casteln., and some allied Australian species not yet described. The second division consists of *Promocoderus* (in which I include *Anheterus*, Putz.), *Cerotalis*, *Adotela*, *Brithystrum* and *Gnathoxys*.

The following is a tabular view of the genera of division II.

a. Prosternum projecting strongly backwards

behind the coxæ..... *Brithystrum*.

aa. Prosternum not projecting backwards behind

the coxæ.....

Form rather narrow, varying from very depressed—as in *P. brunnicornis*, Dej.,—to very convex—as in *P. concolor*, Germ.,—body pedunculate. Head small, usually transversely impressed behind the eyes; the eyes inclosed behind, the post-ocular prominences often greatly developed. Clypeus with a setigerous punctiform impression on each side; forehead often with a shallow impression on each side behind the clypeus. Mandibles strong and slightly hooked at the end; the scrobe having a longitudinal stria in the centre and a setigerous puncture towards the front. Maxillæ narrowly and sharply hooked at the apex, clothed on their inner side with a single row of closely set fine hairs. Labrum transverse, truncate, (in the Tasmanian species of the *P. brunnicornis* group the labrum has a longitudinal sulcus in the middle). Palpi: the last joint of both maxillary and labial elongate, oval, truncate; the penultimate joint of the labial equal to the last in length, of the maxillary triangular, and only half the length of the last. Mentum short, deeply excised in the middle, normally with a short triangular median tooth or elevation (in *P. degener*, Guér., the median tooth is obsolete). Prothorax usually a little broader than long, lightly rounded to the anterior angles, narrowed behind, not lobate; the posterior angles not decidedly marked; the marginal border very narrow, not reflexed, continued on the base at each side (sometimes entire on the base); two conspicuous marginal punctures on each side, the posterior placed about one-third the length of the prothorax in front of the basal angles. Elytra oval, wider than the prothorax, about twice the length; they may be either striate, or lævigata; the lateral margins with four impressions on each side, one close behind the shoulders (in this the marginal channel rises), and three placed towards the apex, of which the first and last are punctiform, the middle one elongate. The thighs are short, and thickened in the middle. The anterior tibiæ not dilatate at the apex, nor having the apex produced externally; the rough spinous part below hardly extending above the upper internal spur. The joints of the tarsi triangular; the posterior tarsi much more elongate and narrow than the others; usually the ♂ has the first

three or four joints of the anterior tarsi, and the first two joints of the middle tarsi spongiose below. (In *P. gracilis*, Germ., (genus *Anhelerus* of Putzeys), and *P. distinctus*, Sloane, the tarsi are not spongiose below in the ♂.) The last joint of the tarsi is generally club-shaped, and much narrowed to the base; sometimes the joint is flattened, and wide at the base. The ventral segments have strongly marked foveæ on each side, often a transverse linear impression extending inwards from the foveæ towards the middle of the segments, (rarely the impressions are almost completely linear); the last segment has in the ♂, a single fine setigerous puncture, and in the ♀ two punctures placed on each side of the anua. (This is the case in all the Australian species, but in Tasmanian species of the *P. brunnicornis* group, there are two punctures in each sex.)

I have found myself greatly hampered by having to make out nearly all de Castelnau's species, and some others, from descriptions; this is a difficult task in such a genus as *Promecoderus*, but, as I have fortunately had a great many species before me, I believe that my identifications of species are as nearly correct as

in spirits, and I did not notice the elytra when freshly collected; still, I think it probable that in no species of *Promecoderus* are the striae of the elytra naturally punctate; though possibly they may be, in one or two cases, finely crenulate. As I have had no opportunity of collecting and experimenting with specimens of *Promecoderus* since making this discovery, I am unable to give such proofs as I should have liked of this action of spirits (which seems to be unknown to practical collectors); but I hope at some future time to describe exactly the results of a lengthened immersion in spirits, both in the Broscini and the Scaritini.

The following table shows the species of *Promecoderus* arranged in natural groups, as far as I have been able to do so with the material at my command. Owing to my having seen only the ♀ of some species, while many others I have not seen at all, I am unable to define the groups into which the species naturally fall as thoroughly as I should have liked; yet the table, incomplete though it be, will be of use to the student, and I hope the detailed descriptions will prove sufficiently full to enable the different species to be distinguished from one another. The names in italics are those of species that I have not seen.

I. Anterior and middle tarsi of ♂ with several of the joints spongiöse below.

A. Labrum with a median sulcus, tooth of mentum very short and broad, or even obsolete; ventral segments in ♂ with transverse rows of piliferous punctures, the last segment with two punctures on each side of the anus in both sexes.

P. brunnicornis, Dej.

P. ovicollis, Casteln.

P. degener, Guér.

**P. tasmanicus*, Casteln.

B. Labrum without a median sulcus, tooth of mentum triangular, ventral segments in ♂ without rows of pili-

* I am doubtful as to the position of this species which has (*vide* Putzeys, Ann. Mus. Civ. Genov. vol. IV., 1873, p. 323) but one puncture on each side of the anus in the ♂, and the ventral segments are without piliferous punctures. It is unknown to me, but the sulcus of the labrum would seem to separate it from all the continental species of *Promecoderus*.

ferous punctures, ♂ with a single puncture on each side of the anus, ♀ with two.

a. Elytra striate; ♂ with four first joints of anterior tarsi spongiöse below.

b. ♂ with fourth joint of anterior tarsi broadly dilatate.

c. Three last ventral segments impressed with lateral foveæ on each side, from which a transverse line extends inwards towards the middle of the segment.

d. Dorsal surface depressed.

e. Marginal border of prothorax not sinuate before the basal angles.

P. neglectus, Casteln.

P. dorsalis, MacI.

P. inornatus, MacI.

P. olivaceus, MacI.

P. semistriatus, Casteln.

ee. Marginal border of prothorax sinuate before the basal angles.

P. subdepressus, Guér.

P. elegans, Casteln.

P. modestus, Casteln.

dd. Dorsal surface convex.

P. gibbosus, Gray.

P. mastersi, MacI.

P. bassi, Casteln.

cc. Three last ventral segments with deep round lateral foveæ, and without transverse striæ.

P. pacificus, n.sp.

P. pygmæus, Casteln.

P. albanensis, Casteln.

bb. ♂ with fourth joint of anterior tarsi narrow, and hardly at all spongiöse below.

P. maritimus, Casteln.

P. interruptus, MacI.

P. striatopunctatus, Casteln.

P. Wilcoxi, Casteln.

P. nigricornis, Casteln.

P. hunteriensis, MacI.

P. nigellus, n.sp.

P. comes, n.sp.

[Here should come, I believe, *P. clivinoides*, Guér., *P. dyschir-ioides*, Guér., and *P. scurooides*, Casteln., species that are unknown to me except from description.]

- aa. Elytra smooth (not more than one stria near the suture),
 ♂ with only first three joints of anterior tarsi
 spongiose below, the fourth joint small.

P. politus, n.sp.

P. oblongus, Casteln.

P. anthracinus, MacL.

P. concolor, Germ.

P. lucidicollis, Casteln.

P. insignis, n.sp.

P. howitti, Casteln.

P. blackburni, n.sp.

- II. Anterior and middle tarsi of ♂ not spongiose below.

- C. Trochanters short, rounded as usual in the genus.

P. gracilis, Germ.

- D. Trochanters long and acute at apex.

P. distinctus, n.sp.

I pass over the species of group A which is confined to Tasmania. I have nothing new to add to it, and without being certain of *P. brunnicornis* no good work can be done among these species.

PROMECODERUS NEGLECTUS.

P. neglectus, Casteln. Trans. Roy. Soc. Victoria, 1868, VIII. p. 170; Putz. Revis. Ann. Mus. Civ. Genov. 1873, IV. p. 324; *P. puella*, Putz. Stett. Ent. Zeit. 1868, p. 343.

♂.—Black, rather opaque on upper surface, under surface and legs black; first joint of antennæ reddish-brown, the others darker. Head with a shallow transverse impression across the vertex, a deep setigerous puncture on each side of the clypeus; the frontal impressions shallow, but more distinctly marked than usual, extending behind the clypeal suture, this distinct; eyes rather prominent; post-ocular prominences large, about two-thirds of eyes. Prothorax flat, rather cordate, almost as long as wide (about 4×4 mm.); the sides very slightly rounded, widest just behind the anterior marginal puncture, gradually narrowing to the base; the posterior angles, viewed from above, rounded; marginal border narrow, not sinuate in front of the basal angles, not reaching the middle of the base; the basal angles well marked though a little obtuse; median line distinct; the transverse impressions in front and behind distinct. Elytra rather obovate ($7\frac{1}{2} \times 4\frac{3}{4}$ mm.), depressed, striate; the shoulders very slightly marked;

not depressed, subconvex, very slightly declivous to the base, broader than long ($3\frac{1}{2} \times 4$ mm.), truncate in front; the anterior angles well marked, broadly margined, but hardly advanced; sides inflated, rounded off in front, obliquely narrowed behind, widest a little before the middle; the marginal border narrow, decidedly widened at the anterior angles, not sinuate before the basal angles, not reaching the middle of the base, the basal angles well marked, very slightly obtuse; the median line deeply impressed; the anterior transverse impression obsolete; the posterior marked towards the sides. Elytra oval ($7 \times 4\frac{3}{4}$ mm.), subconvex, rather flattened towards the base; the sides lightly rounded, the humeral angles being about equally rounded with the hinder part; base truncate behind the peduncle; the striae strongly marked on the back, less so on the sides, first five strong and crenulate, the others indistinct; the interstices rather convex; the first and second posterior lateral punctures connected by a stria. Three last ventral segments deeply foveate on each side; a well marked transverse impression extending from the foveae towards the middle of the segments. Thighs cylindrical, strongly inflated in the middle; ♂ with four first joints of anterior tarsi dilatate and spongiose below; middle tarsi with two joints spongiose; last joint of tarsi flat above and broad towards the base.

Hab.—Porpunkah, at the foot of Mt Buffalo, (on the north side) Victoria. Three specimens (♂) in my collection. This species is very like *P. olivaceus*, from which it differs *inter alia* in its more parallel elytra and broader prothorax, the sides of which are less inflated in the middle and more gently narrowed behind.

PROMECODERUS OLIVACEUS.

P. olivaceus, MacL. l.c. p. 334.

♂.—Dark bronze above, under surface a shining bronzy black; legs black with tarsi brown; parts of the mouth and antennae brown; the first joint of antennae and apex of palpi of a lighter colour. Head rather small; clypeus with the lateral punctures distinct, behind them a short shallow impression on each side

extending beyond the clypeal suture, this distinct between the impressions; vertex with a strong transverse impression; eyes rather prominent; post-ocular prominences large, about two-thirds of eyes. Prothorax cordate, hardly broader than long ($3\frac{1}{4} \times 3\frac{1}{2}$ mm), rather flattened, broadest at about half the length; a strongly marked transverse impression behind, defining the basal part; the sides strongly rounded and narrowed behind; the marginal border narrow, widened at the anterior angles, not sinuate on the sides before the base, not reaching the middle of the base; the basal angles well marked and almost right angles; the median line strongly impressed, not reaching the anterior margin, but almost touching the base. Elytra oval, shorter and proportionately rather broader than usual ($7 \times 4\frac{1}{2}$ mm), subconvex, very little flattened on the dorsal part, very little rounded on the sides, not perceptibly narrowed to the base, strongly striate; the shoulders rounded off; the base truncate between them, and declivous to the peduncle; seven first striae distinctly marked; the interstices flat. Three last ventral segments lightly foveate and transversely impressed on each side. Anterior thighs roundly dilatate; anterior tarsi with four first joints spongiose below, the fourth broad, the last joint not narrowed at the base and rather flattened above.

♀.—Larger, broader, and more convex.

Length $12\frac{1}{2}$ (♂)-14 (♀), breadth $4\frac{1}{2}$ - $5\frac{1}{4}$ mm.

My specimens on which the above description is founded, I received from Mr. A. Lee, as coming from Forest Reefs in the Orange District, New South Wales; Sir William Macleay's specimens were from Piper's Flats near Wallerawang, New South Wales. Closely allied to *P. dorsalis* and *P. semistriatus*. The more noticeable points of difference from the former are:—the general form rather less robust, the frontal impressions of the head fainter, the post-ocular prominences smaller, the foveae of the ventral segments small, and rounder, and the transverse impressions of the segments much fainter; from the latter it appears to differ chiefly in its more robust and more convex form, and in the elytra being less narrowed to the shoulders.

PRONECODERUS SEMISTRIATUS.

P. semistriatus, Casteln. l.c. p. 168; Putz. Revis. 1873, p. 328.

I ascribe this name to a species that I find in the Macleay collection labelled *P. semistriatus*.

It hardly agrees with M. Putzeys' description of *P. semistriatus* in his Revision, being a smaller and lighter insect. M. Putzeys redescribed the type specimens (♀) of Count de Castelnau. His description seems more applicable to *P. olivaceus*, MacL., than to the present species; however, even should *P. olivaceus* prove to extend to the eastern side of the Blue Mountains, I think it will tend less to confusion to apply de Castelnau's name to the present species, which differs from *P. olivaceus*, though there certainly does not appear room for a third species between them.

The following is the description of a specimen (♂) in my collection received from Mr. F. A. A. Skuse as coming from Woronora, 12 miles south of Sydney.

♂ Shining, prothorax blackish green, elytra bronzy olive; under surface piceous black, tibiae, tarsi, and parts of mouth piceous. Head smooth; clypeus with a setigerous puncture on each side; forehead lightly impressed behind the clypeal punctures; vertex with a very strong broad transverse impression; eyes rather prominent; post-ocular prominences less protuberant than the eyes, two-thirds the size; antennae long, slender. Prothorax cordate, ($3\frac{1}{2} \times 3\frac{1}{2}$ mm.), the disc flattened, not declivous behind, a transverse linear impression a little in front of the base, lightly rounded on the sides, very little narrowed to the anterior angles; marginal border narrow, not sinuate in front of the basal angles, not reaching the middle of the base; basal angles well defined, almost right angles; median line deeply impressed. (I have seen three male specimens, and in all there are two lightly marked oblique short linear impressions on the posterior half of the disc, one on each side of the median line; the only female specimen I have seen is without these striolae). Elytra oval ($6\frac{1}{2} \times 4\frac{1}{4}$ mm.), depressed, narrowed to the shoulders, striate, a smooth space near

the edge, six striæ strongly impressed on each elytron; the interstices rather convex. Three last ventral segments with a well marked fovea on each side, from which a linear impression extends inwards towards the middle of the segment. Anterior thighs thickened in the middle; anterior tarsi with four joints, middle tarsi with two joints, spongiose below; last joint of tarsi narrow, a little flattened above, but not narrowed to the base. Length 12, breadth $4\frac{1}{4}$ mm.

Hab.—Woronora, Appin, N.S.W.

The size is constant in the specimens I have seen; it is allied to *P. olivaceus*, from which it differs in its more metallic colour, its much flatter shape, and lighter form.

PROMECODERUS SUBDEPRESSUS.

P. subdepressus, Guér. Rev. Zool. 1841, p. 190; Putz. Stett. Ent. Zeit. 1868, p. 344; Revis. 1873, p. 326.

I am unable to refer any of the forms I know to this species. The following is a translation of M. Putzeys' note on it in his "Revision" of 1873.

Of a greenish black, slightly coppery on the elytra. Parts of the mouth and anterior tarsi testaceous. The post-ocular prominences two-thirds the size of the eyes. Prothorax cordate, elongate, its greatest width is at the anterior third, whence it is strongly narrowed to the base, where the sides are straightened to form the posterior angles which are right angles. The elytra are oval, narrower in front than behind, a little flat behind the scutellum, marked with lightly punctate striæ, the striæ diminish in depth towards the sides where the two last become even hardly visible. The lateral foveæ of the abdomen are prolonged internally by a stria parallel to the segments.

Melbourne; 3 specimens (♂).

M. Putzeys in his monograph of 1868 gives the size as length 12, breadth $4\frac{1}{8}$, elytra $6\frac{1}{2}$ mm.

Guérin gives the locality as Tasmania;* M. Putzeys is evidently wrong in saying † the type came from the Swan River.

* Rev. Zool. 1841, p. 190. † Stett. Ent. Zeit. p. 345.

PRONECODERUS ELEGANS.

P. elegans, Casteln. l.c. p. 169; Putz. Revis. 1873, p. 327.

M. Putzeys regards this in his Revision as a distinct species from *P. subdepressus*; it must however be very closely allied. I have a single example from Melbourne of which the following is a description.

♂.—Shining, of a dark copper colour on the elytra, head and prothorax of a bronzy black; under surface dark bronze with a metallic tinge; the tibiae, tarsi, parts of the mouth, and antennae piceous brown. The antennae reaching the base of the prothorax. Head rather long; clypeus with a foveiform puncture on each side; the frontal impressions very wide and obsolete; the clypeal suture faint; vertex with a strong and wide transverse impression behind the eyes; eyes prominent; post-ocular prominences large, about three-fourths the size of the eyes. Prothorax almost as long as wide (about $3\frac{1}{4} \times 3\frac{1}{4}$ mm.), widest before the middle, sub-convex, being a little flattened along the median line, strongly rounded on the sides, very much narrowed behind; the marginal border decidedly sinuate before the basal angles, extending on each side almost to, but not across, the middle; the basal angles sharply defined, the median line lightly impressed and reaching the base. Elytra rather broad, much wider than the prothorax ($6\frac{1}{4} \times 4\frac{1}{4}$ mm), lightly convex, not flattened near the base, the peduncle below the plane of the elytra, widest behind the middle, and much narrowed to the shoulders; the disc with four distinct striae on each side of the suture, the two following also marked, the sides smooth. Three last ventral segments foveate and transversely striate on each side. Legs light; anterior tarsi with four first joints spongiose, middle with two; last joint of tarsi narrow and club-shaped.

Length 11, breadth $4\frac{1}{2}$ mm.

The specimen before me is evidently *P. elegans*; but that two such "close" species as this and *P. subdepressus* can come from the same locality, and yet maintain constantly distinct characters, seems to me very doubtful. According to M. Putzeys, Guérin's

type of *P. subdepressus* came from the Swan River. Guérin himself gives Tasmania as the habitat. It will probably be found that the Melbourne species is *P. elegans*, and that *P. subdepressus* is from other localities.

PROMECODERUS MODESTUS.

P. modestus, Casteln. l.c. p. 170 ; Putz. Revis. 1873, p. 327.

This species I have not seen. It was described from a single female specimen in the Castelnau collection, and is found in Tasmania. Following is a translation of M. Putzeys' description:—

Of a bronzed black ; palpi, antennæ, and tarsi brown ; first joint of the antennæ of a light red. The tooth of the mentum is triangular, somewhat narrow, emarginate in the centre ; the apex of the lobes is pointed internally. The antennæ reach the base of the prothorax. Each of the lateral punctures of the clypeus is prolonged backwards so as to form an oblique fovea. On the vertex there is, on each side, another fovea equally oblique, but not so deep though more elongate than the first. The post-ocular prominences are half as large as the eyes. The prothorax is cordate, elongated, a little wider than the head, very little narrowed in front, slightly rounded on the sides, which are narrowed to the angles of the base from the anterior third. The posterior angles are right angles ; the marginal border is hardly noticeable in the middle of the base. The median line is little impressed, hardly crossing the two transverse impressions, which are little marked. The elytra are narrow, oblong, elongate, narrowed to the shoulders, flat above, marked with light punctate striæ, of which only the first five are impressed ; the two following are faintly traceable. The segments 2-6 of the abdomen have on each side a wide punctiform fovea ; the last segment is rugose, and has on each side of the anus two piliferous punctures. The upper surface of the tarsi is lightly flattened.

Length $11\frac{1}{2}$, elytra 7, breadth $3\frac{3}{4}$ mm.

PROMECODERUS GIBBOSUS.

Cnemacanthus gibbosus, Gray, Anim. Kingd. II. p. 276 ; Guér. l.c. p. 189 ; Blanch. Voy. Pole Sud, p. 18 : Putz. Stett. Ent. Zeit. 1868, p. 337 ; Revis. 1873, p. 329.

It is unnecessary to minutely describe this well known species. It is of convex form, with strongly striated elytra, the marginal border of the prothorax subsinuate in front of the base, the ventral segments with only a linear impression on each side, the tarsi rather broad, the last joint of the posterior tarsi flattened and broad at the base.

The following are the measurements of a specimen (♀) in my collection from Southern Tasmania:—Length 14, breadth $5\frac{1}{2}$; elytra $8\frac{1}{2} \times 5\frac{1}{2}$; prothorax $4\frac{1}{2} \times 4$ mm. It seems a common species in Tasmania.

PROMECODERUS MASTERSI.

P. Mastersi, MacL. l.c. p. 332.

♀.—Dark bronze above, with a coppery tinge on the elytra (this most noticeable in the striæ); under surface shining black, with sometimes a greenish tinge; tarsi, palpi, and antennæ brown; first joint of antennæ lighter. Head rather large, frontal impressions punctiform on the clypeus, and very feebly impressed backwards towards the vertex; the clypeal suture lightly marked; the vertex with a broad transverse impression; eyes large, not very prominent, inclosed behind; the post-ocular prominences conspicuous, about half the size of the eyes. Prothorax subcordate, a little broader than long ($4\frac{1}{2} \times 4\frac{1}{2}$ mm.), convex (very slightly flattened along the median line) transversely impressed but not declivous behind; the sides lightly rounded and gently narrowed behind; the anterior angles truncate; the basal angles sharply defined though slightly obtuse; the marginal border narrow, widened on the anterior angles, not sinuate before the basal angles; the median line deeply impressed. Elytra convex, oval ($9 \times 5\frac{1}{2}$ mm.), not narrowed to the base, sloping gently to the peduncle, striate, with four or five well marked shallow striæ on each side of the suture; the sides smooth, with traces of obsolete striæ; the interstices flat. The lateral foveæ of the ventral segments very lightly impressed and extending inwards as a transverse linear impression.

Length $14\frac{1}{2}$, breadth $5\frac{1}{2}$ mm.

Hab.—Monaro District, N.S.W.; 2 specimens (♀) in the Australian Museum collection, and 1 in that of Sir William Macleay.

It has probably rather a wide range in the mountainous parts of S. E. Australia; a specimen (♀) in my collection from Goulburn, N.S.W., has the general form rather more elongate and parallel, and the median line hardly at all marked; I cannot, however, regard it as a different species. *P. Mastersi* is very closely allied to *P. gibbosus*, of which it seems to be the continental representative; it has, however, less deeply striate elytra with a coppery tinge in the striae, and the tarsi appear (judging by comparison of the ♀) narrower, the last joint of the hind tarsi being not so broad and more decidedly narrowed to the base.

PROMECODERUS BASSI.

P. bassi, Casteln. l.c. p. 166; Putz. Revis. 1873, p. 329.

This species is unknown to me; the following is a translation of M. Putzeys' very full description of it.

In its prothorax hardly narrowed towards the base with the angles very rounded, and in its elytra very wide in the middle this species is allied to the first group [*P. brunnicornis*, &c.]; but in all its other characters it belongs to the third [*P. gibbosus*, &c.] * It is of a dark bronze, very brilliant; however one of the specimens I have before me has the elytra of a bronzed green. The parts of the mouth, the base and extremity of the antennæ, and the tarsi are of a rather clear brown. The lateral lobes of the mentum end in a point on the internal side, the tooth is narrow, not emarginate. The antennæ do not reach the second marginal point of the prothorax. The two punctures situated

* The groups M. Putzeys refers to are the three main divisions into which that author divided *Promecoderus* (*vide* Ann. Mus. Civ. Genov. IV., 1873, pp. 320, 321). The second of these included only the species belonging to de Castelnan's genus *Cerotalis*; the first and third were separated chiefly by the conformation of the posterior angles of the marginal border of the prothorax; these being in the first very lightly marked or even rounded, and in the third always well marked. To me M. Putzeys' divisions have seemed wanting in exactness, and to result in a very artificial grouping of the species, therefore I have found myself unable to follow them.

near the base of the clypeus are deep and rounded. The impression which separates the vertex from the neck is placed behind the supra-orbital punctures. The eyes are prominent, twice as large as the post-ocular prominences. The prothorax is rather narrow, appearing almost like a transverse square (*corré transversal*) with all the angles rounded; in reality it is broader than long, very convex, truncate in front, the angles very much rounded off, the sides slightly arched to the hinder marginal puncture, whence they are more strongly rounded; the angles of the base are hardly distinct; the median line does not cross any transverse impressions; there is hardly any trace of the basal foveæ; the marginal border is very even, it is only interrupted in the middle of the base. The elytra are perfectly oval with the shoulders a little raised; slightly flattened towards the suture; completely striato-punctate to the fifth stria, from which the striae become weaker and less distinct towards the base and apex. The episterna of the metathorax are shorter than broad. Each of the segments of the abdomen has on each side a wide and deep impression; the two foveæ of each segment are united by a transverse stria; the last segment is rugose and has, according to the sex, one or two punctures on each side of the anus. The anterior tarsi of the ♂ are prolonged externally, but the spongiose clothing of the underside does not extend to the dilatate part, the last joint is broad and flat above as in *P. gibbosus*, but the same joint of the hinder tarsi is more narrow towards the base.

Length $13\frac{1}{2}$, elytra $7\frac{1}{2}$, width 5 mm.

Then follows a comparison with *P. gibbosus* which it is unnecessary to add.

Hab.—King's Island, Bass's Straits.

PRIMECODERUS PACIFICUS, n. sp.

♂.—Upper surface cupreous, shining (sometimes more obscure, or almost black); lower surface of a shining metallic bronze, legs pitchy black, tarsi brown, palpi and antennæ piceous. Head small, convex, smooth; frontal impressions short, shallow, distinct on the clypeus, hardly extending behind the clypeal suture, this distinct

between the impressions ; transverse impression of vertex broad, shallow, hardly marked in the middle ; eyes prominent ; post-ocular prominences moderate, much smaller than the eyes. Prothorax short ($2\frac{3}{4} \times 3\frac{1}{4}$ mm.), rather convex, only a little narrowed behind ; the sides rounded ; marginal border narrow, not sinuate before the basal angles, not reaching the middle of the base ; the basal angles rather obtuse ; the median line strongly impressed, not reaching the base. Elytra oval ($5 \times 3\frac{3}{4}$ mm.), convex, striate (the striae punctate) a very little narrowed to the base ; the sides not at all ampliate ; the dorsal striae (five on each elytron) strong, those on the sides weak ; the intervals not convex. Three last ventral segments with a deep broad fovea on each side, not transversely impressed. Thighs thickened in the middle ; first four joints of anterior tarsi dilatate and spongiose below ; middle tarsi with three first spongiose below (third very slightly so).

Length 11, breadth $3\frac{3}{4}$ mm.

Hab.—Otway Ranges, Victoria.

This species is very distinct from all the described species except *P. pygmaeus* to which, in the form of the basal angles of the prothorax, the foveae of the ventral segments, and the under surface of the tarsi, it has an affinity.

PROMECODERUS PYGMÆUS.

P. pygmaeus, Casteln. l.c. p. 167 ; Putz. Revis. 1873, p. 322.

This species is unknown to me ; the following is M. Putzeys' description :—

Of a shining coppery brown ; parts of the mouth, three first joints of the antennæ, and the tarsi testaceous, the same as the extremity of the thighs. The lobes of the mentum have their internal extremity pointed ; the median tooth is narrow and pointed. The antennæ are long and reach past the base of the elytra ; the second and third joints are brown at the end ; the pubescence begins towards the apex of the third joint. The two impressions between the antennæ are well marked ; the eyes are lightly inclosed, and more prominent than the post-ocular prominences. The prothorax is almost orbiculate, but little

narrowed in front, very rounded behind where the sides are not the least prolonged, and have a shape like that of the first group;* the angles of the base are hardly distinct. The marginal border is very fine and is not prolonged to the middle of the base. The surface is but little convex, especially in the middle; the median line reaches the base; the transverse impressions are well marked, but rather short. The elytra are elongate-oblong, very slightly rounded in the middle; the shoulders are raised, but very much narrowed externally; all the striae, except the seventh, are well marked and finely punctate, becoming more shallow and confused towards the apex; the interstices are a little unequal. The large umbilicate punctures of the lateral margins are bigger than usual. The foveae of the abdominal segments are wide and rounded. The thighs are club-shaped; the anterior tarsi have the four first joints spongiose below; the intermediate are very narrow, only clothed on the three first joints; the last joint of all the tarsi is slender, elongate, and not flattened above."

Length 8, elytra 5, breadth 3 mm.

though a little obtuse. Elytra much wider than the prothorax ($6\frac{3}{4} \times 4\frac{1}{2}$ mm.), broadly oval, subconvex, a little flattened towards the base, marked with light somewhat interrupted striæ, broadly rounded at the apex; the base wide, truncate, the shoulders rounded off. Four last ventral segments impressed with a wide deep fovea on each side. Last joint of tarsi narrow and club-shaped.

Hab.—King George's Sound.

This seems a well marked species; only the ♀ is known to me. There are specimens in the Australian Museum, in Sir William Macleay's collection, and in my own.

PROMECODERUS MARITIMUS.

P. maritimus, Casteln. l.c. p. 167; Putz. Revis. 1873, p. 332.

This species is unknown to me; the following is de Castelnau's description.

"*Promecoderus maritimus*: length $6\frac{1}{2}$ '; of a brilliant black; head large, with several very faint irregular impressions in front and between the eyes; a feeble transverse impression behind these organs; thorax oblong, globular, subcordiform, with feeble transverse impressions in front and behind, and a longitudinal sulcate in the middle; elytra oval, oblong, convex, covered with rather faint punctated striæ; the posterior part of the margin has a few faint punctiform impressions, and a short longitudinal sulcate; some brown hair on the tarsi; antennæ black, with the base of the first articles of a dark brown; the palpi of the latter colour."

"On the seashore of Cape Schank (Victoria)."

From M. Putzeys' remarks we learn that de Castelnau's single specimen was the ♂; and that the spongiose undersurface of the anterior tarsi does not reach the external edge of the joints. He also gives the following measurements.

Length 13, elytra $6\frac{3}{4}$, breadth $4\frac{3}{4}$ mm.

PROMECODERUS STRIATO-PUNCTATUS.

P. striato-punctatus, Casteln l.c. p. 168; Putz. Revis. 1873, p. 332.

I have been unable to determine this species with certainty, so append de Castelnau's description:—

"*Promecoderus striato-punctatus*; length $7\frac{1}{2}$ '; very nearly allied to the preceding [*P. maritimus*], but head smaller; elytra more parallel and cylindrical; the first article of the antennae is of a dark brown, the following black, and the four last of a dark reddish brown; the general colour is dark but brilliant, and more or less metallic."

"I have one specimen from the mountains of Victoria, and another from the Darling River."

M. Putzeys merely briefly notices this species in the following terms:—"Very close to *P. nigricornis*, from which, however, I think it different on account of its longer elytra, which are not nearly so wide in the middle; their apex is less convex. In all other respects the two species are identical." He gives the measurements as—length $13\frac{1}{2}$, elytra $8\frac{1}{4}$, breadth 5 mm.; and adds that de Castelnau's two specimens were ♂.

From these remarks, and the difference of the sex in the described specimens of *P. nigricornis* and *P. striato-punctatus*.

impressions, but a short longitudinal sulcate ; the palpi are brown ; the antennæ black, with the external base of the first three articles of a rather dark brown ; the tarsi have some long brown hair ; palpi of a dark brown."

"Mountains of Victoria."

From the remark above, "the tarsi have some long brown hair," it is evident that de Castelnau's only specimen was the ♀. From M. Putzeys' notice of *P. nigricornis*, I take the following:—"Le rebord [du corselet] marginal s'élargit un peu dans sa moitié inférieure ; il se prolonge nettement au milieu de la base.—Les segments 3-6 de l'abdomen portent de chaque côté une fossette arrondie et profonde." He gives the measurements as—length 14, elytra 8, breadth 6 mm.

PROMECEDERUS NIGELLUS, n. sp.

Black, shining, legs black, tarsi and antennæ of a clear brown, palpi piceous. Head smooth, the frontal foveæ faint, extending behind the clypeal suture (this lightly impressed, and only distinct between the foveæ) ; the transverse impression behind the eyes not extending across the vertex ; eyes prominent ; post-ocular prominences moderate. Prothorax subcordate, a little broader than long ($3\frac{1}{4} \times 3\frac{1}{2}$ mm.), convex, slightly declivous behind, the basal part defined by a transverse impression ; sides rounded, broadest about the middle, obliquely narrowed to the base ; marginal border fine, not sinuate before the basal angles, distinct and entire on the base ; the basal angles almost right angles ; median line strongly impressed, not reaching the anterior margin but terminating in a transverse impression in front, extending to the base behind. Elytra oval ($6\frac{1}{2} \times 4$ mm.), convex, equally rounded in front and behind, striate, the stria next the suture complete, the three next marked on the anterior part but becoming obsolete towards the apex ; the sides smooth to the eye (faint striæ being discernible under a lens). Four last ventral segments with a deep round fovea on each side. Male with the thighs dilatate in the middle ; the anterior tarsi with four first joints spongiöse below, the last joint small ; the middle tarsi with two first joints spongiöse below.

Length 11, breadth 4 mm.

Hab.—Dabee, New South Wales.

A single specimen (♂) from Dabee is in the Australian Museum ; also one (♀) from the Hunter River which, though a little larger is evidently identical. It is a distinct species among those at present described.

PROMECODERUS INTERRUPTUS.

P. interruptus, MacI. l.c. p. 331.

I have examined the type specimen (♀) in Sir William Macleay's collection. It is closely allied to *P. hunteriensis* and *P. wilcoxi*, with the latter of which it may be identical ; the chief difference seems to be the punctures of the elytral striæ, a character to which I attach little importance. The marginal border of the prothorax is very lightly subsinuate before the base, and is entire on the base, though hardly marked in the middle. The ventral segments have a round fovea on each side. The prothorax is convex, and the elytra is a little flattened along the suture on the basal half. The following are the measurements :—

Length $12\frac{1}{2}$, breadth $4\frac{1}{2}$, prothorax $3\frac{3}{4} \times 3\frac{1}{4}$, elytra $7 \times 4\frac{1}{2}$ mm.

Hab.—Clarence River.

PROMECODERUS WILCOXI.

P. wilcoxi, Casteln. l.c. p. 171 ; Putz. Revis. 1873, p. 333.

This species I have never seen ; it is, however, from the description, allied to *P. hunteriensis*, MacI. ; de Castelnau's description is very poor, so I append a translation of that of M. Putzeys. In this the size is omitted, and in de Castelnau's work a misprint occurs about the size, but I believe $6\frac{1}{2}$ lines is intended to be the length given.

Of a coppery black, palpi and antennæ brown ; the apex of the first joint of the antennæ is of a testaceous red. Tooth of the mentum rather wide, truncate at the apex. The impressions between the antennæ are wide and deep ; two others, equally distinct, are noticeable between the eyes ; the post-ocular prominences equal half the eyes. The prothorax is cordate, not extending beyond the eyes at the anterior angles, widening behind to about the anterior third, then narrowing in a curved line to

just before the angles of the base ; the anterior angles are obtuse and very lightly marked ; the posterior angles are well marked and almost right angles. The surface is convex on the sides and a little flattened to the middle ; the median line is deep ; it does not extend beyond either of the transverse impressions, both of which are very distinct. The elytra are oval ; the shoulders are not at all marked ; the border is prolonged to the apex ; the surface is a little flattened only on the first half to about the third stria ; the striae are wide, shallow, lightly punctate ; only the first is entire ; the three following are marked at the base, but do not reach the apex ; the fifth and sixth are only distinct in the middle. The episterna of the metathorax are a little longer than broad. The segments 2-6 of the abdomen have on each side a very deep round fovea ; the last segment is transversely striolate, particularly in the ♀. The anterior and middle tarsi of the ♂ are very narrow, lightly spongiose only in the middle ; the last joint is club-shaped and hardly flattened.

Hab—Clarence River.

PROMECODERUS HUNTERIENSIS.

P. hunteriensis, Maccl. l.c. p. 332.

There are specimens (♀) of this species in Sir William Macleay's collection, in the Australian Museum, and also in my own collection. The following description is from a specimen in my collection. The ♂ I have not seen.

♀.—Of a bronze colour above, under side black ; palpi and first joint of antennae reddish, the rest of the antennae darker. Head narrow, smooth, a deep round puncture on each side of the clypeus ; clypeal suture lightly marked ; the transverse impression across the vertex broad and distinct ; eyes rather prominent ; post-ocular prominences small. Prothorax narrow, a little longer than broad ($3\frac{1}{2} \times 3\frac{1}{4}$ mm.), subconvex, hardly flattened along the median line ; basal part defined, yet not declivous behind ; sides lightly rounded, broadest at about half the length, narrowed to the base ; the anterior angles not at all marked ; the basal angles right angles ; marginal border narrow, not widened on the anterior angles, sinuate on the sides before the basal angles,

reaching the middle of the base from each side, but not perceptible across the middle; the median line very lightly impressed. Elytra elongate, oval ($8 \times 4\frac{3}{4}$ mm.), subconvex, a little flattened near the base and slightly declivous to the peduncle, rather parallel on the sides with the shoulders rounded off, broadest a little behind the middle, but not noticeably narrowed to the base; the striae near the suture distinct, only the first complete, three next distinctly marked on the anterior part, but becoming obsolete towards the apex; the interstices flat; the marginal border fine. Four last ventral segments with a deep round fovea on each side.

Length 14, breadth $4\frac{3}{4}$ mm.

Hab.—Hunter River.

This species seems to differ principally from *P. wilcoxi* and *P. interruptus* in its narrower and more convex form.

PROMECODERTS COMES, n.sp.

Of a shining bronzed black; tarsi, palpi and antennae reddish brown. Head moderate, smooth, frontal impressions broad, shallow, distinct on the clypeus, faint behind the clypeal suture, this distinct between them; transverse impression of the vertex lightly marked, more distinct on each side toward the eyes; eyes prominent, inclosed behind; post-ocular prominences small. Prothorax smooth, about as broad as long (4×4 mm.), very convex, declivous behind, the sides rounded, rather dilatate, and broadest at the middle, gently narrowed to the anterior angles, (these not at all marked), shortly narrowed behind, the marginal border narrow, not sinuate on the sides before the base, rather thicker and entire on the base, the basal angles sharply defined but hardly right angles; median line deeply impressed. Elytra oval (8×5 mm.), convex, striate, widest about the middle, a little declivous to the peduncle behind the scutellum; marginal border narrow; dorsal striae distinct, those of the sides obsolete, three first strongly impressed, but only the first reaching the apex, the others becoming obsolete behind, traces of three more visible towards the sides; the first interstice rather convex. Four last ventral segments with a deep round fovea on each side, (in the ♀ the foveae are often obsolete on the last segment). Male with four

first joints of the anterior tarsi dilatate and spongiose below, (the fourth small and very slightly spongiose) ; middle tarsi with two first joints spongiose. The last joint of the tarsi narrow, not flattened. Prosternum very lightly impressed or even quite smooth between the coxæ.

Length 13-15, breadth $4\frac{1}{2}$ - $5\frac{1}{4}$ mm.

Hab.—Wallangarra, the border station on the railway from Sydney to Brisbane. Taken by Mr. W. Kershaw of Melbourne in December last year.

It is very closely allied to *P. hunteriensis*, from which it differs most noticeably by its more robust and convex form, and in the marginal border of the prothorax being much less sinuate before the basal angles. The measurements in the description are taken from a ♂ 14 mm. long.

PROMECODERUS CLIVINOIDES.

P. clivinoides, Guér. Rev. Zool. p. 189, 1841, No. 4 ; Putz. Stett. Ent. Zeit. 1868, p. 341 ; *P. minutus*, Casteln. l.c. p. 167.

This species is unknown to me. The following is a translation of M. Putzeys' very detailed description.

Of a brilliant bronzed brown ; mouth, palpi and tarsi testaceous, the apex of each article of the antennæ is of a clear brown. The lobes of the mentum are obtusely pointed internally ; the median tooth keeled, rather long and narrow with the point obtuse. The last article of the palpi is of an elongate oval form equally narrowed at both ends and truncate at the apex. The antennæ reach the posterior lateral punctures of the prothorax ; they are slender and filiform. The labrum is subtruncate with the angles obtuse ; its surface is convex without a central sulcus. The clypeus is a little more emarginate ; the impression which separates it from the vertex is only noticeable in the middle, and has on each side a piliferous puncture much smaller than those of the clypeus. The post-ocular prominences are greatly developed, as large as the free part of the eyes, the juxta-ocular channels diverge behind.

"The prothorax is broader than long, a little narrowed behind, very rounded on the sides which are only a little sinuous from the anterior lateral puncture, the anterior margin is truncate, the angles are very little marked and almost square; the posterior angles are a little open though distinctly marked; the lateral border is very fine and extends right across the base. The median line does not reach either margin; it is well marked and situated in a strong longitudinal depression. The two transverse impressions are distinct; that of the base is interrupted in the middle; there is no distinguishable trace of any lateral foveæ. The elytra are almost perfectly oval, only a little more narrowed behind than in front; towards the apex they are a little narrower than the prothorax, and towards the middle a little wider; the sides are depressed (*déprimés*), but the surface is flattened and the sutural part is depressed throughout its length; the striae are shallow, very lightly punctate; the four or five first are tolerably distinct, but not one reaches the apex. In the ♂ the elytra are less dilatate in the middle, consequently their sides are a little more parallel. The end of the prosternum only is impressed, the metasternal episterna are short and square. The four last segments of the abdomen have on each side a strong triangular impression more marked in front and prolonged towards the middle of the abdomen. ♂ with one puncture on each side of the anus; ♀ with two. The thighs are rather narrow; the anterior tarsi have their joints triangular, and a little wider in the ♂ than the ♀. The ♂ has the four first joints of the anterior tarsi and the two first of the intermediate spongiöse; however their external part is glabrous. The posterior tarsi are slender and not flattened above.

Length 11, elytra $7\frac{1}{2}$, width $4\frac{1}{2}$ mm.

Swan River.

PRONECODERUS DYSCHIROIDES.

P. dyschiroides, Guér. l.c. 1849, p. 189; Putz. Stett. Ent. Zeit. 1868, p. 342; Revis. 1873, p. 337.

This is another species that I do not know. The following is M. Putzey's notice of it in his Monograph of the Broscides in 1868.

This species only differs from the preceding [*P. clivinoides*] by its smaller size, and by the shape of the prothorax which is quite different; it is almost globular and seems hardly narrowed behind because the sides are very little dilated or rounded in front; the median line does not present a noticeable depression, though it is strongly impressed; the striæ of the elytra are a little more distinct and punctate. Length $5\frac{1}{2}$, elytra 5, breadth $3\frac{3}{4}$ mm. In spite of these differences I suspect *P. dyschirioides* to be a small-sized variety of *P. clivinoides*. Guérin's type is a ♂ from the Swan River.

In his "Revision" he adds that the prothorax is equally narrowed in front and behind; and that compared with *P. clivinoides* the elytra are a little more elongate and less widened in the middle, while the legs are always red; also that de Castelnau's specimens came from Champion Bay and Esperance Bay.

PROMECODERUS SCAUROIDES.

P. scauroides, Casteln. l.c. p. 169; Putz. Revis. 1873, p. 336. This species is also unknown to me.

M. Putzeys dismisses it in his "Revision" with merely a short comparison with *P. clivinoides* from which he says it differs but little, its chief characters being—the prothorax less narrowed and rounded in front, and more narrowed behind; the elytra more oval and with their greatest breadth a little behind the middle, usually more convex with the striæ more superficial.

De Castelnau's description is as follows:—"Length 4'-5'; black, brilliant; head smooth, with a most feeble transverse impression behind the eyes; thorax semicircular, truncated in front, globular, having two transverse impressions, one in front and the other behind, and a longitudinal sulcate in the middle, extending to the posterior margin; elytra oval, with longitudinal striæ, not extending to the lateral margin; a punctiform impression, and a short longitudinal sulcate on the posterior part of the margin; lower side of the body of a shiny brown; segments of the abdomen having on each side a punctiform impression, which extends in the

form of a short oblique sulcate towards the centre; labrum black, palpi, mandibulæ, and antennæ brown; thighs black, with the tibiæ generally brown; tarsi reddish."

"Swan River."

PROMECODERUS POLITUS, n.sp.

♀.—Black, very shining, first joint of antennæ and apex of palpi piceous. Head rather large, convex; clypeus rugulose, the frontal impressions well marked, extending backwards towards the forehead; clypeal suture lightly marked; transverse impression of vertex wide, shallow, hardly marked in the middle; eyes round, rather prominent; post-ocular prominences moderate, less protuberant than the eyes, and a little more than half their length. Prothorax cordate, about as broad as long (4×4 mm.), lightly convex, a little declivous behind, the basal part being on a lower plane, though not defined by a clearly marked transverse line, truncate in front and behind, lightly rounded on the sides, narrowing to the base from a little before the posterior lateral punctures; marginal border narrow, not widened at the anterior angles, gently sinuate on the sides in front of the basal angles, reaching the middle of the base; the basal angles right angles; the median line strongly impressed; under a lens the surface appears covered with very fine transverse scratches. Elytra oval ($8 \times 4\frac{3}{4}$ mm.), very convex on the sides, but a little flattened along the suture, more pointed at the apex than usual, hardly narrowed to the base, the shoulders rounded off, gently declivous to the peduncle; a single stria on each side of the suture finely but distinctly marked, and reaching the apex (though appearing smooth to the naked eyes, other striæ are visible, as fine wavy lines, under a lens). Four last ventral segments of abdomen with deep round foveæ on each side. Last joint of tarsi narrowed to the base, and not flattened above.

Length 14, breadth $4\frac{3}{4}$ mm.

Hab.—Lachlan River, N.S.W. I took two specimens (♀) about 20 miles west from Condobolin in February 1889.

It is closely allied to *P. anthracinus* from which it may be distinguished by its more protuberant eyes, more cordate prothorax, less convex elytra, &c.

PROMECODERUS ANTHRACINUS.

P. anthracinus, Maccl. l.c. p. 334.

♂.—Shining black with a slight metallic lustre; tarsi, palpi, and antennæ piceous. Head rather small, smooth; the clypeal suture faint; vertex with the transverse impression very wide and shallow; eyes not prominent, inclosed behind; the post-ocular prominences wide, about half the length of the eyes. Prothorax rather cordate, transverse ($4 \times 4\frac{1}{2}$ mm.), convex, strongly rounded on the sides, widest just behind the anterior marginal puncture, very slightly declivous behind; marginal border not sinuate before the basal angles, entire on the base; the basal angles sharply marked, though hardly right angles, the median line lightly impressed; the anterior and posterior transverse impressions well marked. Elytra rather short, oval ($7\frac{1}{2} \times 4\frac{1}{2}$ mm.), hardly narrowed at the base and broadly rounded behind; the stria next the suture complete, the rest of the elytra smooth, though under a lens faint traces of striæ are visible. The four last ventral segments with a broad foveiform impression on each side. Anterior tarsi with four first joints broadly triangular; three first of the anterior and two first of middle tarsi spongiose below; the trochanters short and very bluntly pointed at the apex.

♀.—More bronzed in colour, with the prothorax less rotundate on the sides ($3\frac{3}{4} \times 4\frac{1}{4}$ mm.), and more narrowed behind; the elytra proportionately broader in the middle, less broadly rounded behind, and more decidedly substriate.

Hab.—Wagga Wagga, N.S.W.

Nearly allied to *P. howitti*, from which it differs in its more robust form, the ♂ with shorter and more transverse prothorax, shorter elytra, and more bluntly pointed trochanters; they are very "close" species

PROMECODERUS LUCIDICOLLIS.

P. lucidicollis, Casteln. l.c. p. 171; Putz. Revis. 1873, p. 335;
P. riverina, MacL. l.c. p. 331.

In general appearance very much resembling *P. gracilis*, Germ., but larger. Shining, colour varying from bronzy black to a metallic green, antennæ, except the first joint, fuscous. Head smooth; the clypeal suture distinct; eyes prominent, inclosed behind; the post-ocular prominences not large. Prothorax subcordate, a little wider than long (about $3\frac{1}{2} \times 3\frac{3}{4}$ mm.), lightly rounded on the sides, narrowed, but not constricted behind; the median line deeply impressed. Elytra oval ($7\frac{1}{2} \times 4\frac{1}{2}$ mm.), convex, not narrowed at the shoulders, widest about the middle, the sides subparallel, the stria next the suture entire, very faintly impressed, traces of others visible with a lens. Four ventral segments with very broad lateral foveæ. Male with the joints of the anterior tarsi triangular, less dilatate than usual; three first joints of anterior, and two first of middle tarsi spongiosæ below.

Length 11-13, breadth $3\frac{3}{4}$ - $4\frac{1}{2}$ mm.

Hab.—Melbourne; Mulwala, Deniliquin, Murrumbidgee River, New South Wales. A common and plentiful species.

This species is very nearly allied to *P. howitti*, but is smaller and narrower; the broad lateral impressions of the ventral segments also differ from the more sharply defined punctiform ones of *P. howitti*.

PROMECODERUS HOWITTI.

P. howitti, Casteln. l.c. p. 171; Putz. Revis. p. 335.

This is the Victorian form of *P. concolor*, from which it is very hard to find good specific distinctions.

Colour shining bronzy black, with a metallic lustre, sometimes of a greenish hue. Its form is less robust and convex than *P. concolor*, and the elytra are more narrowed to the shoulders. The metasternal episterna seem narrower.

The following are the measurements of a specimen (♂) from Melbourne:—

Length $14\frac{1}{2}$, breadth 5 mm., prothorax $4\frac{1}{4} \times 4\frac{1}{2}$, elytra $8\frac{1}{2} \times 5$ mm.

This species seems to have a wide range ; there are specimens in my collection, which I refer to it, from Melbourne, Sale, and Tallarook, in Victoria ; and from Mulwala and Gunbower on the Murray. It is a well known species, and very common in many parts of Victoria.

PROMECODERUS OBLONGUS.

P. oblongus, Casteln. l.c. p. 169 ; Putz. Revis. 1873, p. 334.

This species is unknown to me. Only a single ♂, de Castelnau's type, has been reported. Judging from M. Putzeys' very complete description, its slightly narrower form seems to be all that separates it from *P. howitti* ; of which I believe it will be found to be a variety. I cannot regard it as a distinct species. The difference in colour—*P. oblongus* being "of a metallic green"—I attach no weight to ; in *P. lucidicollis* the colour varies from bronze to metallic green, and I believe the same thing occurs in *P. howitti*.

PROMECODERUS CONCOLOR.

P. concolor, Germ. Linn. Ent. 1848, III. p. 168 ; Putz. Revis. 1873, p. 335 ; *P. suturalis*, Casteln. l.c. p. 170 ; Putz. Stett. Ent. Zeit. 1868, p. 341 ; Revis. 1873, p. 335 ; *P. lucidus*, Putz. Stett. Ent. Zeit. 1868, p. 339.

♂.—Lævigate ; of a shining bronzed back ; general form convex. Head smooth, with the frontal impressions hardly marked ; the clypeal suture distinct ; eyes prominent, inclosed behind ; the post-ocular prominences not large. Prothorax rather cordate, a little wider than long ($4\frac{1}{4} \times 4\frac{3}{4}$ mm.), very convex, declivous behind, constricted near the base ; the lateral margins very slightly sinuate before the basal angles. Elytra very convex, smooth ($9 \times 5\frac{1}{2}$ mm.), subparallel on the sides, not narrowed to the shoulders. Four last ventral segments with a deep round foveiform impression on each side. The anterior tarsi with the three first joints dilatate and spongiose below, the fourth smaller, the trochanters short and rounded at the apex.

Q.—Narrower in the prothorax ($4 \times 4\frac{1}{2}$ mm.), the elytra hardly so wide at the shoulders, the stria next the suture marked.

Hab.—Adelaide (Rev. T. Blackburn), and western parts of Victoria.

From *P. anthracinus*, MacL., to which it is closely allied, it differs in its more robust and convex form, the prothorax in the ♂ is much narrower in proportion to the elytra, and the elytra are proportionately wider, more convex, and much more declivous to the peduncle.

I cannot think that *P. suturalis*, Casteln., is anything more than at most a variety of *P. concolor*.

PROMECODERUS INSIGNIS, n.sp.

Of a bronzy olive colour, shining; (a narrow edging of green extends along the lateral channel of both elytra and prothorax) underside brighter, of a greenish or bluish black; legs black, tarsi dark brown, palpi dark with apex reddish; antennae dark brown, first joint reddish-brown, three first joints glabrous, seven last densely cinereo-pilose. Head smooth, large; frontal impressions broad, shallow, extending behind the clypeal suture (this lightly marked); the vertex with a broad and strongly marked transverse impression; eyes prominent; post-ocular prominences small. Prothorax smooth, hardly as broad as long ($4\frac{3}{4} \times 4\frac{1}{2}$ mm.), convex, truncate in front and behind, narrowed and somewhat constricted behind, a strongly marked transverse impression across the posterior part; sides lightly rounded; anterior angles very little narrowed with the border not widened; the marginal border narrow, entire on the base, sinuate before the basal angles, these right angles; the median line distinctly marked. Elytra smooth, oval ($9\frac{3}{4} \times 5\frac{1}{2}$ mm.), convex, rounded on the sides, widest a little behind the middle (thus appearing a little narrower to the shoulders); the marginal border narrow, a little wider behind; the sutural stria complete, distinctly marked, but rather obsolete towards the apex, second rising from an impressed puncture not reaching the apex. Four last ventral segments with a strong round fovea on each side. Prosternum very lightly impressed

between the coxæ, and vertical behind. ♂ with three first joints of anterior, and two first of middle tarsi spongiöse below.

Length $15\frac{1}{2}$ -18, breadth 5-6 mm.

Hab.—Forest Reefs in the district of Orange, N.S.W.

I am indebted to Mr. A. Lee for this fine species; it is the largest *Promecoderus* I have seen. Its affinity is to *P. howitti* and *P. concolor*; the narrow green edge along the lateral channel of the elytra and prothorax will serve to distinguish it from these species; there are other differences, as size, shape, &c.

PROMECODERUS BLACKBURNI, n.sp.

♂ Very shining black, with a metallic tinge—especially on the head and undersurface. Head smooth; clypeus with a setigerous puncture on each side; the transverse impression behind the eyes broad, very lightly marked, crossing the vertex; eyes rather prominent; post-ocular prominences small; antennæ slender. Prothorax about as wide as long, ($3\frac{1}{4} \times 3\frac{1}{2}$ mm.), convex, declivous behind, rounded and rather dilatate on the sides, broadest about the middle, shortly and obliquely narrowed to the base; marginal border narrow, not sinuate on the sides in front of the basal angles, entire on the base; the basal angles right angles; the median line lightly but distinctly impressed. Elytra short, oval, ($6\frac{1}{2} \times 4\frac{1}{2}$ mm.), smooth, (with a lens traces of very faint striæ are visible). Four last ventral segments with deep round foveæ on each side, without internal striæ. Anterior thighs thickened in the middle; first three joints of anterior, and first two of middle tarsi spongiöse below.

♀.—Of a generally narrower form than the ♂; prothorax less dilatate at the sides; elytra more narrowed in front, and less broadly rounded behind.

Length $11\frac{1}{2}$ -13, breadth $4\frac{1}{2}$ mm.

Hab.—Port Lincoln, S.A., (Rev. Thos. Blackburn).

A very distinct species, differing from all those known to me by its broad and short form.

PROMECODERUS DISTINCTUS, n.sp.

Black, with a bronzy green tinge on upper surface, and a coppery metallic tinge on the lower surface. Head somewhat flat in front, without a transverse impression across the vertex; clypeus with a rather rugose impression on each side extending slightly backwards behind the clypeal suture, (this distinct); the eyes not very prominent, the post-ocular tubercles strong, but not nearly the length of the eyes; mandibles long, the upper side longitudinally rugose at the sides of the labrum and smooth in front; labrum without a longitudinal median impression, the angles rounded, very lightly emarginate between them; mentum with distinct median tooth; maxillary palpi with the last joint narrowed to the apex. Prothorax a little broader than long, ($4\frac{1}{2} \times 4\frac{1}{2}$ mm.) subconvex, a little flattened near the median line, lightly rounded on the sides, widest at about half the length, shortly narrowed to the base, declivous and transversely impressed behind; marginal border very narrow, subsinuate before the basal angles, entire on the base; basal angles well marked, very slightly obtuse; the median line distinctly impressed, not reaching the anterior margin, but extending to the base, its course crossed by transverse striae. Elytra broad, obovate ($7\frac{1}{2} \times 5\frac{1}{2}$ mm.), subconvex, very slightly narrowed at the shoulders; lightly rounded on the sides, widest just behind the middle, smooth; two striae next the suture distinct towards the base (with a lens traces of these and others may be seen along the length of the elytra); suture lightly impressed; lateral margins narrow, the usual marginal impressions; ventral segments deeply foveate on each side. Trochanters long and pointed.

Length 14-15, breadth $5\frac{1}{2}$ mm.

Hab.—Magadup, W.A. Two specimens in the Australian Museum.

A very distinct species; in general appearance resembling a broad *Cerotalis*. The long and pointed trochanters distinguish it at once from all described species of *Promecoderus*. The two specimens known to me are in the Australian Museum, and are

both in rather an imperfect state, so that it is impossible to examine them as thoroughly as one could wish ; they appear to be both males, having only one setigerous puncture on each side of the anus ; in both the tarsi are not spongiose below. A more thorough examination of both sexes may show that this species should be removed from *Promecoderus*, but at present I prefer to leave it in that genus. There is an undescribed allied species in the Australian Museum, but the specimens are too old to describe satisfactorily ; there is also a specimen in Sir William Macleay's collection which represents a new species. These specimens are from Western Australia.

PROMECODERUS GRACILIS.

P. gracilis, Germ. l.c. p. 169 ; *Anheterus gracilis*, Putz. Stett. Ent. Zeit. 1868, p. 345 ; *P. parvulus*, Maccl. l.c. p. 331.

A well known species which it would serve no useful purpose to redescribe. M. Putzeys founded a new genus *Anheterus* for *P. gracilis*, on account of the ♂ having no spongiose tissue on the underside of the joints of the anterior tarsi. In all other respects it agrees with *Promecoderus*, and, as that genus stands at present, I think this an insufficient reason for subdividing it. In any case, as genera can merely be looked upon as arbitrary assemblages of species, if we apply hard and fast rules in their definition it is apt to lead specialists into an endless number of generic divisions that causes the binomial system to become almost as cumbrous as that it supplanted, and tends to completely bewilder all who do not devote a laborious and wearying research into the intricacies of nomenclature.

I cannot separate *P. parvulus* Maccl. from *P. gracilis*, and have therefore been compelled to regard them as identical.

Hab.—N. S. Wales (Mulwala, Wagga Wagga, Bathurst, &c.), and South Australia.

Genus CEROTALIS.

Cerotalis, Casteln. l.c. p. 175.

By M. Putzeys, Count de Castelnau's genus *Cerotalis* has been looked upon as merely a division of *Promecoderus*, but I think it

may be regarded as of generic value. Its chief characteristics are:—

General form elongate; size rather larger than is usual in *Promecoderus*. The sides of the head only slightly swollen behind the eyes to inclose them; the eyes not prominent. *Mentum* without any median tooth. Labrum transverse, with a light median sulcus. Palpi: maxillary with last joint thick, cylindric, truncate; labial the same, but thicker; ♂ with the last joint of the palpi much thicker than in ♀. Legs: the thighs thick in the middle; the anterior tibiae wider at the end than in *Promecoderus* (the apex being slightly produced externally), the rough spinous portion of the lower surface extending considerably above the upper internal spine; ♂ with four first joints of the anterior tarsi dilatate and spongiose below; middle tarsi with three or two (*C. amabilis*) first joints spongiose below; ♀ with a very small denti form protection on the lower side of the anterior tibiae near the coxae (in *C. amabilis* hardly perceptible). ♂ with one setigerous puncture on each side of the anus, ♀ with two.

CEROTALIS SEMIVIOLOACEA.

C. semiviolacea, Casteln. l.c. p. 175; *Promecoderus semiviolacea*, Putz. Stett. Ent. Zeit. 1868, p. 336; Revis. 1873, p. 325.

A well known South Australian species from Port Lincoln; I have also received a specimen from the Rev. T. Blackburn from the Adelaide district. A detailed description is unnecessary. It is smooth, shining; of a rather bronzy black above (sometimes with a purplish reflection towards the sides and base of the prothorax), the under surface of a violet-blue with the legs black. The upper surface is rather flat; the prothorax considerably narrowed behind; the elytra widest behind the middle, and narrowing to the shoulders. The following are the measurements of a typical specimen (♂)—Length 17, breadth $5\frac{1}{2}$, prothorax $5\frac{1}{2} \times 5\frac{1}{2}$, elytra $9 \times 5\frac{1}{2}$ mm.

CEROTALIS SUBSTRIATA.

C. substriata, Casteln. l.c. p. 175; *Promecoderus substriatus*, Putz. Stett. Ent. Zeit. 1868, p. 335; Revis. 1873, p. 325.

Upper surface black with a bluish tinge, under surface a brilliant steely-blue. Prothorax depressed with the median line well marked. The elytra with interrupted irregular striæ. The segments of the abdomen with a shallow transverse impression extending towards the middle from each side.

Length 15, breadth 5, elytra 8×5 , prothorax $4\frac{1}{2} \times 4\frac{1}{4}$ mm.

Hab.—King George's Sound.

CEROTALIS MAJUSCULA.

Promecoderus majusculus, Putz. Stett. Ent. Zeit. 1868, p. 336; Revis. 1873, p. 325.

I have never seen this species; it is probably a Western form. From the description I am doubtful if it is distinct from *C. substriata*.

The following is M. Putzeys' description:—Of a bronze-black above, of a beautiful steel-blue below, mandibles, palpi, antennæ, and tarsi black. Like *P. semiviolaceus*, it differs from *P. substriatus* by the convexity of the prothorax and elytra. The elytra are as long as those of *P. substriatus* but wider in the middle; to the naked eye they appear smooth, beneath a lens very weak undulating and rather unequal striæ are visible. The lateral punctures are the same as those in *P. semiviolaceus*. The anterior thighs show the same projection below [in ♀].

Length 20, elytra 11, breadth 7 mm.

Hab.—Australia.

CEROTALIS VERSICOLOR.

C. versicolor, Casteln. l.c. p. 175.

I have never seen this species; it was described by de Castelnau from a specimen in the collection of the late Dr. Howitt, and was unknown to Putzeys. The following is de Castelnau's brief description:—“*Cerotalis versicolor*: length 7'; of a rather dark green; thorax covered with transverse striolæ and the elytra with feeble punctated striæ; a few punctures, larger than the others, are irregularly dispersed in these striæ; on the posterior part of

the margin a few punctiform impressions; mouth, antennæ, inferior side of the body and legs of a reddish brown."

"Victoria."

CEROTALIS AMABILIS, n.sp.

Upper surface of a bronzy-olive colour, the sides and base of the prothorax and the sides of the elytra narrowly margined with green; under surface shining black with a slight metallic tinge, a bright blue patch on each side of the head behind the buccal fissure; legs black; parts of the mouth and antennæ almost black. Head not large; mandibles rather long; clypeus wrinkled, with a setigerous puncture on each side, behind which the shallow frontal impressions extend, these also wrinkled; forehead raised above the plane of the vertex, and squarely divided from the occiput; occipital part smooth; eyes not very prominent, the head not swollen behind them. Antennæ rather short, sub-moniliform, four first joints glabrous, the others thickly covered with short hairs. Prothorax a little longer than broad ($4\frac{1}{2} \times 4\frac{1}{4}$ mm.), convex, declivous behind, the basal part well defined by the posterior transverse line; the sides very lightly rounded to the anterior angles, behind them almost parallel to the middle, then narrowed to the base; marginal border not wider or at all produced at the anterior angles, entire on the base, sharply sinuate on each side a little in front of the basal angles, then straight; the basal angles right angles. Elytra oval ($8\frac{1}{4} \times 5$ mm.), convex, covered with rows of closely-placed fine punctures, forming light interrupted striae, and with minute transverse scratches; rugulose towards the apex; sides sub-parallel; the shoulders lightly rounded, not narrowed; base declivous and lightly emarginate behind the scutellum; apex broadly rounded and somewhat flattened towards the margins; suture strongly impressed; the lateral margins becoming thicker and more reflexed towards the apex; a part along the sides rather rough and not polished like the rest of the elytra; three posterior marginal impressions almost as usual in *Promecoderus*, only the middle one not so elongate. The ventral segments smooth, the

fourth and fifth (the two before the last) with very lightly marked lateral foveæ, the last transversely rugulose. Anterior thighs short and thickened in the middle. ♂ with four first joints of anterior tarsi dilatate and spongiose below; two first joints of middle tarsi spongiose below.

♂ with the small dentiform projection on the underside of the anterior tibia very feeble and only perceptible with a lens.

♂ Length 15, breadth 5 mm; ♀ length 13½, breadth 4½ mm.

Hab.—Coomooboolaroo, Duaringa, Queensland. Kindly sent to me by Mr. Geo. Barnard.

This is a very distinct species; it is more parallel in shape than *C. semiviolacea*, the prothorax is much contracted towards the base so that the lateral margins are decidedly sinuate before the base which they meet at right angles; the ♂ has the labial palpi thicker than usual in this genus, and has the intermediate tarsi with only two joints, and those lightly, spongiose below; in the ♀ the small dentiform projection on the lower side of each anterior tibia is hardly discernible even with a lens.

Genus ADOTELA.

Adotela, Casteln. l.c. p. 174; *Parroa*, Casteln. l.c. p. 173.

When de Castelnau wrote on the Australian Broscini in 1867 he was misled by the very different form of the palpi in the different sexes in this genus, and formed a separate genus for each sex, (*Adotela* for the ♂, and *Parroa* for the ♀). In this he was followed by M. Putzeys in his paper on the Broscini in 1868*, who, however, in his Revision of 1873†, recognised that the two forms were merely the sexes of the same genus.

I am unable with the material at present at my command to make a thorough definition of this genus, and for a more detailed description than I am now able to give must refer the student to the works of de Castelnau and M. Putzeys quoted above. Of the fourteen species of which this genus will now consist, I only know seven species, and of five of these have seen but a

* Stett. Ent. Zeit. 1868, pp. 347, 349.

† Ann. Mus. Civ. Genov. IV. p. 337.

single ♀. The two species of which I know both sexes are *A. carenoides*, Putz, and *A. viridis*, MacL., which are very closely allied, so that it would be unsafe to base a definition of the genus merely on their points of resemblance. As far as possible for me to determine at present, the following are the chief characters of *Adotela*.

Size large (as compared to *Promecoderus*), form robust and convex. Mentum without any median tooth. Antennæ filiform, depressed, last joint sometimes narrow and tapering, sometimes short and obtuse. Palpi: in ♂ maxillary with last joint securiform, labial with last joint very securiform; in ♀ last joint of both palpi thick, cylindrical, truncate. Labrum usually emarginate in front, sometimes very lightly so, or even truncate. Elytra with an impressed puncture on each side at the base. Legs: thighs variable, anterior tibiæ dilatate at the end, the apex acute or dentiform externally, the spinous portion of the lower surface extending above the upper internal spine almost to the base of the joint. The ventral segments without lateral foveæ. Middle tarsi without any spongiose tissue on the lower side in ♂. (This only refers to the two species *A. carenoides* and *A. viridis*, of which I know the ♂.)

The following is all that I can attempt in the way of tabulating the species from my present knowledge of them. The species in italics I have never seen.

a Exterior edge of anterior tibiæ smooth.

b Labrum rounded.

bb Labrum emarginate.

A. howitti, Casteln.

A. carbonaria, Casteln.

c Brightly coloured.

A. carenoides, Putz.

A. violacea, Casteln.

A. viridis, MacL.

A. esmeralda, Casteln.

A. bicolor, Casteln.

d Black.

e Anterior angles of prothorax not advanced.

A. atronitens, n.sp.

A. australis, n.sp.

cc Anterior angles of prothorax advanced.

A. grandis, Casteln. *A. concolor*, Casteln.

aa Exterior edge of anterior tibiæ with a projection or projections above the apex.

A. nigerrima, MacL. *A. striolata*, Putz.

A. frenchi, n.sp.

ADOTELA HOWITTI.

Parroa howittii, Casteln. l.c. p. 173 ; Putz. Revis. 1873, p. 338.

♀.—Black, shining. Head broad, without frontal impressions, except a setigerous puncture on each side of the clypeus ; the clypeal suture distinct ; eyes convex, but not prominent, the sides of the head a little swollen behind them ; antennæ submoniliform, depressed (in the specimen before me the flattened sides of the antennæ after the 3rd joint are punctated). Labrum rounded on the sides, truncate and sex-punctate in front, the middle lightly canaliculate. Prothorax convex, a little broader than long (7 × 8 mm.), a little narrowed to the base ; the lateral margins conspicuous, almost straight on the sides between the marginal punctures, thicker and somewhat crenate behind, reaching the base in full width and without any sinuosity, wider in front to the anterior angles—these obtusely produced ; the base truncate, not margined ; the disc transversely striolate ; the median line very lightly marked. Elytra oval (15 × 10 mm.), convex, smooth, very declivous behind, peduncle broad and but little below the plane of the elytra in the middle ; scutellum broadly turbinate, instead of semicircular the usual form in the genus ; sides parallel ; the shoulders rounded ; the lateral margins narrow, finely reflexed, wider towards the apex ; a row of fine punctures (about 13) along the sides from the shoulders to near the apex. Anterior thighs long, flattened, the tibiæ slightly uneven exteriorly towards the apex, the apex broad ; middle tibiæ punctate, spinous, widened, but not the least dentiform externally at the apex ; trochanters oval, bluntly pointed behind. Prosternum not excavate between the coxæ, rounded behind. Ventral segments impunctate, except for two fine punctures on each side of the anus.

A single ♀ specimen kindly lent me by Mr. A. Sidney Olliff, taken in the neighbourhood of Wilcannia, N.S.W. Mr. Olliff, has placed the specimen in the Australian Museum.

ADOTELA CARBONARIA.

Parroa carbonaria, Casteln. l.c. p. 174; Putz. Revis. 1873, p. 340.

De Castelnau's description is quite useless. The following is a translation of M. Putzeys' remarks in his Revision:—

Of a brilliant black like *A. howitti*. Last joint of the palpi broad and truncate. Labrum rounded in front. Clypeus having two strong longitudinal impressions which extend to the vertex. Head less narrowed behind, which makes the eyes more prominent. Prothorax like that of *A. concolor*, but a little more rounded on the sides. Elytra similar but more narrowed and even acuminate behind.

Length 16, elytra 9, breadth 6 mm.

Hab.—Swan River.

ADOTELA CARENOIDES.

A. carenoides, Putz. Revis. 1873, p. 341.

Of a beautiful purple, more metallic on the under surface, upper surface sometimes dull in ♀. Head not convex; clypeus with a strong rugulose fovea on each side; two other light rather oblique impressions on the forehead behind these foveae; the clypeal suture distinct; eyes round, not very prominent. Labrum with a median sulcus, rounded at the sides, anterior edge corneous, lightly emarginate. Prothorax subcordate, transverse ($5\frac{1}{2} \times 6$ mm.), subconvex, rounded on the sides, a little narrowed in front, shortly narrowed behind; the base wide; marginal border wide and thick on the sides, slightly advanced at the anterior angles, strongly sinuate in front of the base, not conspicuous on the base; the basal angles right angles; median line lightly impressed, terminating behind considerably in front of the base in a transverse linear impression, this more decided towards the sides; dorsal surface covered with faint transverse scratches. Elytra broadly

oval ($9\frac{1}{2} \times 6\frac{1}{2}$ mm.), convex, lævigata, though rather rugulose near the apex, gently declivous to the peduncle; the lateral margins narrow on the anterior half, becoming wide and upturned towards the apex; sides subparallel; the shoulders rounded off; a lateral puncture on each side behind the shoulders, two or three others where the lateral margins begin to widen behind. Anterior tibiae smooth on the external edge; ♂ with anterior tibiae with three first joints dilatate and spongiose below; middle tarsi not spongiose below. Two punctures on each side of the anus in both sexes.

Length $15\frac{1}{2}$ -20, breadth $5\frac{1}{2}$ -7 mm.

Specimen described above (♂) 17 mm. long.

Hab.—Port Denison, Duaringa, Queensland.

I am indebted to Mr. Geo. Barnard for my specimens, which were taken by him at Coomooboolaroo, near Duaringa.

ADOTELA VIRIDIS.

Promecoderus viridis, Maccl. l.c. p. 99.

Closely allied to *A. carenoides*, the most conspicuous difference being the colour of the upper surface, which is of a shining greenish black on the prothorax, with the elytra greener; the under surface is the same colour as in *A. carenoides*. The head is smoother, the prothorax hardly so wide, more evenly and less suddenly narrowed behind, with the lateral margins not so wide and less advanced at the anterior angles.

The measurements of a specimen ♂ in my collection are—length 14, prothorax $4\frac{1}{2} \times 4\frac{3}{4}$, elytra $7\frac{1}{2} \times 5$ mm.

Hab.—Gayndah, Queensland.

ADOTELA VIOLACEA.

Parroa violacea, Casteln. l.c. p. 174; Putz. Revis. 1873, p. 340.

The species is unknown to me: the following is de Castelnau's description.

"Length $10\frac{1}{2}$ "; black, not very brilliant, with a purple tinge, becoming on the elytra of a beautiful purple; thorax rounded, globular, with the lateral margins narrow, and the anterior angles

a little advanced; it has a longitudinal sulcate in the middle, and a transverse impression in front and behind; its surface is marked with transverse striae, and its posterior margin with longitudinal ones; elytra having their posterior part rather rugous; inferior part of the body of a rather brilliant black."

"Swan River."

From M. Putzeys' Revision we learn that it is a more narrow species than *A. concolor*, the breadth being $7\frac{1}{2}$ mm.; that the labrum is emarginate, and that the anterior tibiae are more decidedly dilatate at the apex.

ADOTELA ESMERALDA.

A. esmeralda, Casteln. l.c., p. 175; Putz. Revis. 1873, p. 340.

De Castelnau's description of this species is very poor; and M. Putzeys has merely a short notice of it in his Revision, of which the following is the substance:—

Black, with the elytra of a beautiful metallic green, the sides of the head and prothorax the same. The form is rather like that of *A. concolor*, but the prothorax is narrower and longer, more narrowed to the base where the angles are more decided; the elytra are less oval, their sides are more parallel. The two first joints are spongy below in the ♂.

Length 20, elytra 11, breadth $7\frac{1}{2}$ mm.

Hab.—Swan River.

ADOTELA BICOLOR.

Parroa bicolor, Casteln. l.c. 174.

This species was described by de Castelnau from a specimen in Dr. Howitt's collection, and was unknown to M. Putzeys, who, not having seen it, does not remark on it. The following is de Castelnau's exceedingly brief description:—

"Length 7', brilliant, of a fine purple, with the elytra green; thorax globular, with the margin green; elytra smooth, with a few granulations on the posterior part of the margin; antennae, mouth, and legs black, the latter with rugous hair."

"From the Paroo River; in Dr. Howitt's collection."

ADOTELA ATRONITENS, n.sp.

♀.—Very shining black, as if varnished; lævigata. Head smooth, convex; clypeus with a setigerous puncture on each side, the lateral foveæ obsolete; clypeal suture distinct; vertex with a very faint transverse impression behind; the pre-ocular prominences small; eyes not prominent, not inclosed behind, sides of the head not swollen behind the eyes. Antennæ submoniliform; apical joint short, with the apex rounded. Labrum very slightly emarginate, median impression light. Prothorax a little broader than long ($4\frac{3}{4} \times 5$ mm.), very convex, declivous behind, truncate in front and behind, widest about the middle, very slightly rounded on the sides, a little narrowed in front, lightly narrowed to the base; anterior angles not advanced; marginal border narrow, hardly sinuate before the base, entire on the base; the basal angles right angles; the median line very lightly marked, crossed in front and behind by lightly marked transverse impressions. Elytra transversely oval ($9 \times 5\frac{3}{4}$ mm.), very convex, smooth, rounded at the shoulders, strongly declivous to the peduncle; apex broadly rounded; sides short, almost parallel, the lateral margins narrow, wider behind; one marginal puncture on each side, behind the shoulders, as in *Promecoderus*; towards the apex the elytra rather undulate near the margin, among the undulations three impressed points on each side; a faint puncture on each elytron near the base. Ventral segments, except the apical, with two punctures towards the middle and no lateral foveæ; the last segment transversely rugose, with two punctures on each side of the anus. Anterior legs with the thighs short, thickened in the middle; the tibiæ broad at the apex and ending anteriorly in a dentiform projection; middle tibiæ spinous, wide at the apex, ending exteriorly in a short dentiform projection; trochanters short and rounded behind. Prosternum excavate between the coxæ and truncate behind.

Length 16, breadth $5\frac{3}{4}$ mm.

A single specimen (♂) in my collection, received from Mr. C. French, as coming from South-west Australia.

This species resembles *A. australis*, but is larger, has the prothorax more convex and less sharply narrowed behind, the elytra broader and more convex. I should have regarded this species as probably *A. concolor*, had not M. Putzeys' comparison between that species and *A. howitti* led me to suppose (though he does not actually say so) that the anterior angles of the prothorax project in *A. concolor*, as in *A. howitti*; also, from his not noticing it, I think the prothorax in *A. concolor* must, like that of *A. howitti*, be without an entire margin on the base. Nor have I been able to regard it as *A. carbonaria*, a species I have not seen, because the palpi in the ♀ are not broad, the labrum is not rounded in front, and the elytra are very broadly rounded behind.

ADOTELA AUSTRALIS, n.sp.

♀.—Black, shining. Head convex behind, rather rugose in the frontal impressions, these broad and shallow; pre-ocular prominences small; eyes prominent, not inclosed behind, the sides of the head not swollen behind them. Antennæ moniliform, apical joint short with the apex rounded. Labrum very slightly emarginate; the median impression light, only visible near the clypeus. Prothorax transverse ($4 \times 4\frac{1}{2}$ mm.), convex, declivous behind, truncate in front and behind, broadest a little before the middle, broad in front; the anterior angles very shortly rounded, not advanced; sides lightly rounded, decidedly narrower to the base; the marginal border narrow, a little sinuate before the base, entire on the base; the basal angles right angles; the median line lightly marked, crossed behind by a lightly marked transverse impression. Elytra oval (8×5 mm.), convex, smooth, rounded at the shoulders and declivous to the peduncle, apex broadly rounded, sides parallel; lateral margins fine, wider behind; the marginal punctures as in *A. atronitens*, only the elytra not undulate near the sides towards the apex; a faint puncture on each elytron near the base; the suture very lightly impressed. Ventral segments (except the apical) with two punctures towards the middle and no lateral foveæ, the last segment with two punctures on each side of the anus. Anterior legs with the thighs

short, the tibiae broad at the apex, acute, but not dentiform exteriorly; middle tibiae spinous, rather wide at the apex and somewhat dentiform exteriorly; trochanters short, and rounded behind. Prosternum excavate between the coxæ, truncate.

Length 14, breadth 5 mm.

Hab.—Wallaroo, S.A.

A single specimen in the Australian Museum.

In general appearance this species resembles *Promecoderus concolor*, but the shape of its prothorax and elytra are proportionately broader; it can readily be distinguished by the entire absence of any tooth to the mentum. It is closely allied to *A. atronitens*, from which it differs in its smaller size; in its prothorax broader in front, more decidedly narrowed behind, with the lateral border more sinuate before the base; in its elytra proportionately longer, and more parallel on the sides, &c.

ADOTELA GRANDIS.

Parroa grandis, Casteln. l.c. p. 174; Putz Stett. Ent. Zeit. 1868, p. 350; Revis. 1873, p. 339.

This species I have never seen; the following is a translation of M. Putzeys' description (Stett. Ent. Zeit. p. 350):—

Length 31, elytra 18, breadth 11 mm.

Entirely of a dull black; the head is very large, swollen behind. The vertex is very convex, quite smooth: the two juxta-ocular grooves are narrow, diverging. The eyes are large, but sunken and not at all prominent. The prothorax is almost quadrate, lightly narrowed behind, but as it is very convex, and the sides are very much rounded off, it seems rather globular. The anterior and posterior margins are truncate; the anterior angles project a little; the sides are very little rounded; a little before the base they are sinuate, then they become straight at the basal angles, which are right; the marginal border only becomes wide towards the anterior part; it does not extend along the base. All the surface is smooth. The median line is only distinct in the middle; only a faint trace of the anterior transverse line is visible. The posterior impression without being very deeply

impressed is strongly marked and reaches, almost parallel to the base, to within a short distance of the sides. The elytra are oblong, a little more narrowed behind than in front, where the shoulders are very much rounded off; the marginal border is narrow, and only becomes wider a little before the apex; the end of the elytra is a little upturned. All the surface is smooth; 12 to 14 piliferous punctures, rather wide but shallow, are visible along the margins.

In his "Revision" of 1873, comparing it with *A. howitti*, M. Putzeys says: "Very near but differing in its less brilliant colour; in its greater size, in its shorter prothorax, more rounded on the sides and less narrowed behind; in its wider elytra with the humeral margin less reflexed, the sides a little more dilatate and the apex more rugose. The abdomen is less smooth; the anterior tibiae are not sinuate externally. The labrum is emarginate in the middle, rounded on the sides."

Hab.—Swan River.

Only the ♀ is recorded.

ADOTELA CONCOLOR.

A. concolor, Casteln. l.c. p. 175; Putz. Stett. Ent. Zeit. 1868, p. 348; Revis. 1873, p. 339.

Not known to me; the following is a translation of M. Putzeys' remarks on it in his Revision:—

Length 21, elytra 12, breadth 8 mm.

Of a slightly dull black, intermediate between *A. howitti* and *A. grandis*. It differs from the first in its emarginate labrum; in its head wider behind in the ♂; in its wider and shorter prothorax less rounded in front, not so narrowed but more rounded behind, where the angles are just as sharp but smaller. The elytra are shorter, more oval, and more rounded on the sides; the piliferous punctures of the margin are interrupted in the middle; the anterior tibiae are not the least sinuate externally. It differs from the second in its size, in its prothorax much less rounded on the anterior part of the sides, in its shorter and more oval elytra.'

From his detailed description of a specimen (♀) in his monograph of 1868 we gather that the anterior angles [of the prothorax] are a little advanced, but their point is obtuse; the marginal border [is] rather fine and becomes straight towards the base to form the posterior angles which are right but not acuminate.

Hab.—Swan River.

ADOTELA NIGERRIMA.

A. nigerrima, Maccl. l.c. p. 335.

I supplement Sir William Macleay's original description with the following note made from an examination of his type.

Black, shining. Head smooth. Labrum rounded on the sides; anterior margin corneous, lightly emarginate in the middle. Prothorax short, transverse ($4\frac{1}{2} \times 4\frac{3}{4}$ mm.), lightly rounded on the sides, very shortly narrowed behind, marginal borders rather wide, crenate, a little widened and slightly advanced at the anterior angles, sinuate in front of the base, not extending to the base; median line lightly impressed, reaching the base; dorsal surface finely transversely striolate. Elytra oval ($8\frac{1}{2} \times 5\frac{1}{2}$ mm.), convex, smooth; apex subacuminate; lateral margins very narrow along the sides, flattened and widened behind; surface covered with minute scratches. Anterior tibiae narrow, widened at the apex, armed externally with a sharp tooth-like projection opposite the upper internal spine. Length 14, breadth $5\frac{1}{2}$ mm.

Hab.—Percy Islands.

A single specimen (♀) in the Macleay collection, for the opportunity of examining which I have to thank Sir William Macleay.

ADOTELA STRIOLATA.

A. striolata, Putz. Revis. 1873, p. 341.

Unknown to me; I translate M. Putzeys' description.

Of a very brilliant black; palpi, antennæ and tibiae of a clear brown. The antennæ are rather slender. The labrum is deeply emarginate in a half circle; the clypeus is equally emarginate, but angularly. On the anterior part of the vertex there are two foveæ which unite behind leaving a raised space between them. The

eyes are not at all prominent. The head is very broad behind. The prothorax is convex, cupuliform, truncate in front, without projecting angles. The angles of the base are depressed and sharply right angles; the median line is lightly marked. The posterior transverse impression is very near the base and decidedly distinct. The elytra are oblong, a little narrower towards the base than at the apex which is broadly rounded; the sides are a little arched. The surface is convex; the striae are hardly marked, and their place is taken for the greater part by lines of tolerably separated punctures; the suture is impressed. The piliferous punctures of the margin are large, widely interrupted in the middle. There is a complete row of piliferous punctures in the middle of each of segments 3-5 of the abdomen. The external margin of the anterior tibiae is furnished with three or four small teeth.

Length 15, elytra 7, breadth $5\frac{1}{2}$ mm.

Hab.—Roebuck Bay. One specimen (♀).

ADOTELA FRENCHI, n.sp.

♀.—Deep black, shining, the lower surface more polished than the upper. Head smooth, rather flat between the antennae, (the middle a little raised); vertex convex, and without any transverse impression; clypeus with the usual setigerous punctures on each side, and half way between them another similar puncture; the clypeal suture finely impressed, ending on each side in a round puncture placed behind and a little further from the margins of the head than the lateral clypeal punctures; behind these, and still further towards the middle of the head, two smaller punctures, one on each side; the pre-ocular prominences large; eyes not prominent; sides of the head a little swollen behind them. Mandibles short, thick, not longitudinally striate in the scrobe. Antennae filiform, attenuate towards the apex, apical joint narrow, acuminate. Palpi with last joint depressed and broadly truncate. Labrum rounded on the sides and at the anterior angles, the anterior margin deeply emarginate, with six large setigerous punctures, lightly canaliculate in the middle.

Prothorax almost as broad as long, ($7\frac{1}{4} \times 7$ mm.), subconvex, truncate in front and behind, widest about the middle; anterior angles not advanced; sides hardly rounded, a very little narrowed in front, lightly narrowed to the base; the lateral margins wide, crenate, not reflexed, not reaching the base; the base not margined; the disc transversely striolate; the median line very faint. Elytra oval ($13\frac{1}{2} \times 8$ mm.), convex, smooth (except towards the apex, where the margins are rough), very declivous behind, with the apex rather acuminate; the peduncle wide, and hardly below the plane of the elytra in the middle; the sides hardly rounded, but widest in the middle, gently rounded off at the shoulders and obliquely rounded behind; the lateral margins very fine, not reflexed, a little widened from behind the middle to the apex; the suture lightly impressed; each side with three strong marginal punctures near the shoulders, and three others at the beginning of the roughened apical portion of the elytra; scutellum lunulate behind. Anterior thighs long, flattened; the tibiae with a small dentiform projection on the outer edge opposite the upper internal spur, dilatate at the apex, and externally ending in a dentiform projection, internally with a small sharp tooth just above the long apical one; middle tibiae with two acute spines internally, apex widened, and acutely pointed externally; trochanters very short and wide behind. The ventral segments, except the last, longitudinally rugulose near the sides, impunctate; the last segment rugulose towards the apex, and without any punctures on each side of the anus.

Length 21, breadth 8 mm.

Hab.—Macdonnell Ranges, Central Australia.

This fine species is very distinct from all those previously described. I am indebted for my single specimen to Mr C. French, Government Entomologist of Victoria, to whom I dedicate the species.

The following is a list of the authors whose papers contain all necessary references to the genera and species treated of in this paper.

CASTELNAU, Count F. de. "Notes on Australian Coleoptera." Trans. Roy. Soc. Victoria, VIII. 1868, pp. 166-176.

DEJEAN. "Species Général des Coléoptères, &c.", 1829, IV. pp. 26-29.

GERMAR, E. F. "Beiträge zur Insektenfauna von Adelaide." Linn. Ent. III. 1848, pp. 168, 169.

GUERIN-MENEVILLE. "Description de quelques Coléoptères nouveaux, provenant de la Tasmanie, &c." Rev. Zool. 1841, pp. 186-190.

MACLEAY, W. "The Insects of Gayndah." Trans. Ent. Soc. N.S.W., II. 1873, p. 99; "Miscellanea Entomologica." *Ibid.* pp. 330-335.

PUTZEYS, J. "Les Broscides." Stett. Ent. Zeit. 1868, pp. 328-350.

——— "Révision des Broscides de l'Australie d'après la collection de M. le Comte de Castelnau." Ann. Mus. Civ. Genov. IV. 1873, pp. 319-342.

NOTES AND EXHIBITS.

Baron von Mueller sent for exhibition a flowering specimen of *Musgravea stenostachya*, described in his paper.

Mr. A. Sidney Olliff exhibited some Scale-insects or Coccididæ which had been sent to him by Mr. H. Goss, through the kind intervention of Mr. J. W. Douglas. The insects were from Natal—where they had been found on *Acacia melanoxylon* and *Grevillea robusta*, introduced Australian trees—and were the same as those exhibited at the May Meeting of the Entomological Society of London in 1889. Mr. Douglas had expressed the opinion that these insects belong to the Brachyscelidæ, a family of gall-making Coccids, suggesting, however, that some entomologist in Australia might, from local knowledge, be able to say something more definite concerning them. Mr. Olliff said that it appeared to him that the insects were certainly not Brachyscelids as those insects, both males and females, live within woody galls on various species of *Eucalyptus*, whereas it appeared that the specimens received from Mr. Douglas were true chitinous “scales,” probably those of the adult female Coccids.

Mr. Maiden exhibited (1) samples of wheat from various districts in New South Wales showing the effects of rust both on the foliage and on the “tassel;” (2) the fruits of an undetermined palm from the New Hebrides, from which a pink dye-stuff is obtainable; (3) “Lake cotton,” an alga thrown up on the shores of Lake Corangamite, Victoria, a similar substance to which was formerly occasionally employed in Europe as a substitute for tow; and (4) the following specimens from North Queensland:—The capsule of *Bombax malabaricum*, DC.; Coorwah Nuts (*Omphalea queenslandiæ*, F. M. Bailey); the fruits of an undetermined Loranthus; the seeds of the “Coy-you” the flavour of which when fresh is said to be not unlike coffee; and the fruits of Quinine (*Petalostigma quadriloculare*).

Dr. Cobb exhibited the apparatus described in his paper, and also various preparations of microscopic organisms in illustration of the methods of using them.

Mr. Sloane exhibited a large collection of Coleoptera in illustration of his paper.

Mr. Froggatt exhibited specimens of a small moth (Fam. *Tineidae*) obtained from a tin of cayenne pepper bought in Sydney, on which the larvæ were found to be feeding and subsequently pupating.

[REDACTED]

WEDNESDAY, 30TH APRIL, 1890.

The President, Professor Stephens, M.A., F.G.S., in the Chair.

Mr. R. Helms was present as a visitor.

Mr. J. H. Rose, Walgett, was elected a Member of the Society.

DONATIONS.

"Report of the Auckland Institute and Museum for 1889-90."
From the Institute.

"Archives Néerlandaises des Sciences Exactes et Naturelles."
Tome XXIV., Liv. 1 (1890). *De la part de la Société Hollandaise
des Sciences à Harlem.*

"Victoria.—Final Report of Royal Commission to inquire into
and report upon the Sanitary Condition of Melbourne." *From
the Commission.*

"Comptes Rendus des Séances de l'Académie des Sciences,
Paris." Tome CLX., Nos. 26 and 27 (1889). *From the Academy.*

"Proceedings of the Royal Society of London." Vol. XLV.,
Nos. 277-279; XLVI., Nos. 280-284 (1889). *From the Society.*

"Journal of the Royal Microscopical Society of London, 1889."
Part 6a; "1890." Part 1. *From the Society.*

"Abstracts of Proceedings of the Zoological Society of London, 14th January, 4th and 18th February, and 4th and 18th March, 1890." *From the Society.*

A Pamphlet entitled "A Catalogue of North American Palæozoic Crustacea confined to the non-Trilobitic Genera and Species." By Anthony W. Vogdes. *From the Author.*

"The Quarterly Journal of the Geological Society of London." Vol. XLVI., Part 1 (No. 181), 1890. *From the Society.*

"Transactions of the Wagner Free Institute of Science of Philadelphia." Vol. II. (1889). *From the Institute.*

"The American Naturalist." Vols. XXIII., No. 273 (Sept., 1889); XXIV., No. 277 (Jan., 1890). *From the Editors.*

"The Perak Government Gazette." Vol. III., Nos. 6-9 (Feb. and March, 1890). *From the Government Secretary.*

"Bulletin de la Société Royale de Botanique de Belgique." Tome XXVIII. (1889). *From the Society.*

"Zoologischer Anzeiger." XIII. Jahrg., Nos. 328-330 (1890). *From the Editor.*

"Stettiner Entomologische Zeitung." 50 Jahrg., Nos. 7-9 (1889); "Reichenbachia.—Orchids Illustrated and Described by F. Sander, &c." Vol. II., No. 10 (1889). *From Sir William Macleay, F.L.S., &c.*

"Queensland.—Report on the Sellheim Silver Mines and Surrounding District." By Robert L. Jack, Government Geologist. *From the Author.*

"Abhandlungen aus dem Gebiete der Naturwissenschaften herausgegeben vom Naturwissenschaftlichen Verein in Hamburg." XI. Band, Heft 1 (1889). *From the Society.*

"Proceedings of the United States National Museum." Vol. XII (1889), Nos. 761-772 (pp. 1-218). *From the Museum.*

"Johns Hopkins University Circulars." Vol. IX., No. 78 (Feb., 1890). *From the University.*

"The Australasian Journal of Pharmacy." Vol. V., Nos. 51 and 52 (March and April, 1890). *From the Editor.*

"Department of Mines, Sydney.—Records of the Geological Survey of New South Wales." Vol. I., Part 3 (1889). *From the Minister for Mines.*

"Technological Museum, Sydney; Descriptive Catalogue, No. I.—Raw Wools, and Specimens to illustrate the Woollen Manufacture." By Alfred Hawkesworth. *From the Curator.*

"The Victorian Naturalist." Vol. VI., No. 12 (April, 1890). *From the Field Naturalists' Club of Victoria.*

"The Journal of the Bombay Natural History Society. Vol. IV., Nos. 3 and 4 (1889). *From the Society.*

"Records of the Geological Survey of India." Vol. XXIII., Part 1 (1890). *From the Director.*

"Second Systematic Census of Australian Plants." Part I.—Vasculares. By Baron Ferdinand von Mueller, K.C.M.G., M.D., Ph.D., F.R.S., &c., Government Botanist for the Colony of Victoria. *From the Premier of Victoria, through the Librarian, Public Library, Melbourne.*

"New South Wales, 1890; Royal Commission of Inquiry into Schemes for Extermination of Rabbits in Australasia.—Progress Report, Minutes of Proceedings, Minutes of Evidence, and Appendices." *From Dr. Oscar Katz, M.A.*

"Papers and Proceedings of the Royal Society of Tasmania for 1889." *From the Society.*

"Colonial Museum and Geological Survey of New Zealand.—Reports of Geological Explorations during 1885 and 1886-87." (Nos. 17 and 18); "Twentieth, Twenty-First, and Twenty-Second Annual Reports on the Colonial Museum and Laboratory" (1884-86.) *From R. Etheridge, Esq.*

"Transactions of the Royal Society of Victoria." Vol. I., Part 2 (1889). *From the Society.*

"Lectures on the Vegetable Kingdom, with special reference to the Flora of Australia." By William Woolls, Ph.D., F.L.S. *From the Author.*

"Proceedings of the Cambridge Philosophical Society." Vol. VII., Part 1 (1889). *From the Society.*

"Mémoires de la Société des Naturalistes de la Nouvelle-Russie, Odessa." Tome XIV., Part 2 (1889); "Mémoires de la Section Mathématique de la Société." Tome X. (1889). *From the Society.*

"Bulletin de la Société Belge de Microscopie." 16me. Année, No. 4 (1890). *From the Society.*

A Pamphlet entitled "Recherche des Animaux Marins, progrès réalisés sur l'*Hirondelle* dans l'outillage spécial," par le Prince Albert de Monaco. *From the Author.*

"Revista de Sciencias Naturaes e Sociaes órgão dos Trabalhos da Sociedade Carlos Ribeiro." Vol. I., No. 3 (1889). *From the Society.*

"The Journal of Conchology." Vol. VI., No. 4 (Oct., 1889). *From the Conchological Society of Great Britain and Ireland.*

"Bulletin de la Société Impériale des Naturalistes de Moscou." Année 1889, No. 3. *From the Society.*

"Feuille des Jeunes Naturalistes." No. 233 (March, 1890).
From the Editor.

"The Journal of Comparative Medicine and Veterinary Archives." Vol. XL, No. 2 (Feb., 1890). *From the Editor.*

"Bulletin de la Société Zoologique de France pour l'Année 1889." Tome XIV., No. 10 ; XV., No. 1 (Dec., 1889, and Jan., 1890). *From the Society.*

"Verhandlungen der Gesellschaft für Erdkunde zu Berlin." Band XVI., No. 10 ; XVII., No. 1 (1889-90) ; "Zeitschrift." Band XXIV., Heft 5 ; XXV., Heft 1 (1889-90). *From the Society.*

DESCRIPTIONS OF HITHERTO UNRECORDED
AUSTRALIAN PLANTS.

BY BARON VON MUELLER, K.C.M.G., M.D., PH.D., F.R.S.

(Continued from page 188.)

ERIOCAULON CARSONI.

Rather dwarf, glabrous; leaves all basal, tufted, from a broad base semilanceolate-linear, gradually much narrowed upwards; stems rather robust, twice as long as the leaves or somewhat longer, angular, constituting leafless peduncles; headlets of flowers comparatively small, globular; bracts broadish, blunt, appressed, from brownish turning gradually pale or yellowish; flowers hardly numerous, some imperfect; receptacle narrow-conical; sepals about as long as the corolla, those of the staminate flowers three, pellucid, spatular- or linear-cuneate, somewhat lacerated at the upper end; tube of the staminate corolla conspicuously longer than the lobes, obverse-conic, lobes slightly fringed, marked by a dark glandular spot; stamens mostly six, their anthers roundish and almost black; sepals of the pistillate flowers broad, constantly without any carinular membrane, but cymbiform-folded, opaque, whitish, often two; petals ovate- or narrow-lanceolar, apiculate, brownish upwards; style very short; stigmas generally three, tender-capillary; fruit turgid, often three-valved, slightly pointed; seeds pale-brownish, broad-ellipsoid, shining, almost smooth, somewhat pellucid.

Forming ample tufts on a somewhat saline spring (called by the aborigines "Wee-Wata") at Kallara, towards the junction of the Paroo and Darling-River; Duncan Carson.

Possibly perennial. Leaves from 1 to 3 inches long, towards the base $\frac{1}{8}$ to $\frac{1}{2}$ inch broad. Peduncular stems $1\frac{1}{2}$ to 5 inches long. Well developed headlets of flowers measuring about $\frac{1}{4}$ inch. Bracts of the lower flowers rather firm and somewhat acute. This species differs already from all other Australian congeners in the shape of the corolla of the staminate flowers.

NOTES ON AUSTRALIAN ABORIGINAL STONE WEAPONS AND IMPLEMENTS.

BY R. ETHERIDGE, JUN.

(PALEONTOLOGIST TO THE AUSTRALIAN MUSEUM, AND GEOLOGICAL
SURVEY OF NEW SOUTH WALES.)

(PLATES IX. and X., figs. 1-5.)

i.—*The Knife used by the Mulligan River (North Central Queensland) Aborigines in the "Mika Operation."*

I am indebted to the kindness of Mr. H. S. W. Crummer, of the Department of Lands, for an opportunity of describing the stone implement, or knife, used by the blacks of the Mulligan River in performing the curious rite known as the "Mika," or, as it is sometimes written "Mikæ" operation. Notwithstanding that more than one reliable account has been published of it, there still seems to be much scepticism and ignorance on the subject. I have, therefore, endeavoured to bring together a brief account of all that has been written on the subject before furnishing a description of the knife itself. The latter is the more necessary, for quite recently Mr. Carl Lumholtz has figured a similar knife from Georgina River, which differs to some extent from Crummer's example.

One of the first, if not absolutely the first, to notice the peculiar custom or rite, known under the above name, appears to have been the late Governor E. J. Eyre in 1840-41, during his exploration of the country around the Great Australian Bight,* he at that time being Resident Magistrate of the Murray River District.

* "Journals of Expeditions of Discovery into Central Australia," &c., 1840-41, 2 vols., London, 1845.

Eyre noticed the rite amongst the Aborigines of the Bight and the Port Lincoln Districts, and describes it as "*finditus usque ad urethram a parte infera penis.*"* It was performed on lads from twelve to fourteen, who were also circumcised.

From the statements of Mr. W. H. R. Jessop, Albert A. C. Le Souëf, and Dr. Milne Robertson, it would appear that more than one form of this rite occurs. The first of these authors says: "Thus circumcision prevails among all tribes, but varies both in the manner and the time of its operation. As well as I could ascertain there appear to be four distinct methods of performing this ceremony—Circumcision proper, Division, Perforation, and Depilation. The first is the most common, and is found nearly everywhere; the third and fourth are practised chiefly on the Murray, whilst the second occurs but seldom."†

Now, although these remarks are ostensibly meant to refer only to circumcision, I cannot help thinking that the subjects of "Division" or "Perforation" have some bearing on the matter now under consideration. Indeed this would to some extent appear to be borne out by the observations of Mr. Le Souëf, who says that amongst the Gawler Range blacks in South Australia an incision is made at the base of the scrotum.‡ The account given by Dr. Milne Robertson,§ being the results of personal observation of aboriginal prisoners at Rottnest Island, Western Australia, is most valuable, and coincides with that given by Dr. Cox. In the case of the De Grey River blacks, the urethra is opened from the meatus urinarius to the middle of the penis;

* Vol. I., p. 212; Vol. II., p. 332.

† "*Flindersland and Sturtland; or the Inside and Outside of Australia*" (2 vols. 8vo, London, 1862), Vol. ii. p. 205. I quite fail to see what connection can exist between Depilation and Circumcision. The former was much practised by certain of the South Australian tribes, and consists of the plucking of every hair from the front of the body. (See Sadlier, *Aborigines of Australia*, 1883, p. 11.)

‡ Smyth's "*Aborigines of Victoria*," 1878, Vol. ii. p. 296.

§ "*Report upon certain peculiar Habits and Customs of the Aborigines of Western Australia*," &c., p. 8 (8vo, Perth, W.A., 1879).

whilst the natives inhabiting the north side of the Murchison River make the incision from the meatus to the scrotum, the sides of the wound being kept apart by rubbing stones up and down it. The instrument used is said to be a sharp stone, which is preserved afterwards with much secrecy. Dr. Robertson considers the origin of the operation to be obscure, and not from a desire to restrict population. He states that as performed by the De Grey blacks it is a mild form of malformation known as Hypospadias. A large amount of interesting information is given about this rite and its results by this author, which need not be repeated here, but he distinctly states that it does not in his estimation prevent fecundity.

Dr. J. C. Cox has recorded* the observations of two gentlemen who had lived amongst the blacks who practise the "Mika" operation, Messrs. Sydney Brown, and H. Bloomfield. Dr. Cox describes the rite as a slitting of the urethra "from the posterior part of the meatus at the point of the glans, along the median line of the under surface of the penis as far back as the scrotum." Mr. S. Brown informed Dr. Cox that the "Mika" operation was performed by the tribes to the northwest of Fort Bourke; whilst Mr. Bloomfield ascertained the existence of the custom about Fort Constantine Station on the Cloncurry River, 270 miles south of Normanton; about the head waters of the Cloncurry River; in the Mackinlay Ranges; and amongst some other tribes mentioned by Dr. Cox.

An equally clear account of this singular ceremony is given by Dr. J. M. Creed † who calls it the "most perfect form of "Malthusianism practicable." According to this writer the "Mika" operation is practised throughout the whole of the interior of the continent "from the eastern boundary of the watershed of the Georgina River on the east, to nearly the settled districts of Western Australia on the west, and from the coast range on the north to Cooper's Creek Watershed on the south." He describes

* Proc. Linn. Soc. N.S. Wales, 1881, V.. Pt. 4, p. 633.

† Australian Medical Gazette, Vol. II., 1883, p. 95.

the opening as just anterior to the scrotum and from one to one and a-half inches long, or the whole of the posterior wall of the urethra is removed. It is performed both at about the age of puberty, or at a more advanced period of life.

We now know that this slitting of the urethra is practised by the West Kimberley Aborigines, for Mr. W. W. Froggatt* noticed it during his recent collecting tour there. He says that the lads are first circumcised about the age of nine or ten, then "about five years later, the young men undergo a much more severe rite, namely the slitting of the urethra, which is conducted with further mysteries."

Next to that of Dr. Robertson, probably the most complete account of the "Mika" operation emanated from the pen of the late M. Miklouho-Maclay, and it is much to be regretted that a copy of his paper† does not exist in Sydney; at any rate, I have been unable to find one.

Lastly, Lumholtz has figured‡ the "Mika"-knife used by the natives of the Georgina River. He states that it does not arise from a desire to limit population in consequence of a scarcity of food, but from an objection on the part of parents to being troubled with too many children, although he rather contradicts this view by stating that in some tribes the children are operated on. Lumholtz has ascertained that the rite is practised by the tribes west of the Diamantina River, and west and north of the Gulf of Carpentaria.§

Unlike the method described by Dr. Cox, the Georgina River blacks are said by Lumholtz to cut an aperture only an inch long at the base of the penis, the edges of the wound being burnt with

* Proc. Linn. Soc. N. S. Wales, 1888, III., Pt. 2, p. 652.

† "Ueber die Mika-Operation in Central Australien." *Zeitsch. für Ethnol.* (Verhandl.) 1880, XII., p. 85.

‡ "Among Cannibals," &c., 1890, p. 48.

§ *Ibid.* p. 47, note. I presume north of the Gulf of Carpentaria would imply Cape York.

hot stones, presumedly to cauterise it, and then kept apart by small sticks, resulting in the formation of a permanent opening through which the spermatic fluid is emitted. Mr. A. J. Vogan, of the 'Illustrated London News' staff, who has just returned from the Mulligan River, informs me that the blacks around Sandringham Station, the locality at which Mr. Crummer's Mika knife was obtained, slit up the entire length of the urethra, after the manner described by Dr. Cox, and that he had personally examined two such cases.

The Mulligan River knife consists of a highly altered schist, now in the condition of a jasperoid rock, and at the after end is encased in a more or less rounded mass of resin, which serves as a handle, the wooden termination represented in Lumholtz's figure being absent here. The entire length of the weapon is seven and a half inches, that of the blade four and a half. It is three-edged, one face practically flat and unworked, the other angular and divided by a rather excentric ridge. The smaller of the two faces thus produced is again separated into two parts by a somewhat oblique subsidiary ridge passing to the cutting edge. There are no traces of any secondary working. The cutting edge is somewhat irregular in outline, but excellently well kept in the one plane, terminating forwards in a slightly jagged point, and very sharp. The surface is perfectly smooth. The blade at its insertion in the resin is all but two inches in width. The section is widely triangular, with the apex of the triangle somewhat excentric.

The figure given by Lumholtz is the only one of the Mika-knife with which I am acquainted. Like that from Sandringham, it is a three-sided weapon, with two of the cutting edges very sharp. Instead of a simple handle of resin, the latter is, in this case, used as the medium of uniting the knife to its wooden handle, which is described as painted with chalk figures, whilst the intermediate resinous portion is ornamented with reddish-brown ochre. The knife was encased in a sheath made of two pieces of tea-tree bark, placed together, and kept in apposition by a binding string spun

from opossum hair. The surface of the sheath is whitened with chalk, and terminates at the smaller end in a tuft of red cockatoo down.*

Mr. Lumholtz adds that the knives are procured by making a fire on suitable rock, and then pouring water on it, resulting in the flaking off of the desired piece. But Mr. Vogan tells me that the Mulligan River blacks throw heated stones directly into water, causing their fracture, and from the fragments of which likely pieces are selected. Two such fragments, brought by Mr. Vogan, are exhibited, consisting of a white chalcedonic quartz. One is simply a flake with a decided conchoidal fracture, and which could well be made use of in Aboriginal daily life; whilst the other partakes more of the nature of a core fragment. Its general shape is rather that of the Mika-knife, but what would be the angular face is deeply furrowed. At the upper end, one edge still bears traces of fire action.

The extreme in the existence of this rite appears to be reached by the blacks inhabiting the west coast of the Gulf of Carpentaria, and for one hundred miles inland between the Roper and Nicholson Rivers, who slit the urethra, according to Inspector P. Foelsche† of the Northern Territory Police, "from its opening right down to the root." The rite is performed at eighteen years of age, but is preceded by circumcision at fourteen. Among these men a sharp shell is used as well as a stone knife.

The object of the Mika-operation appears to be unknown at present, the blacks being either unable or unwilling to divulge it. By most writers and observers its adoption is supposed to be a means of limiting population, a kind of Malthusianism. This seems to be the view of Dr. Creed, as he says it renders the men "for the future sterile, but not impotent." Dr. Milne Robertson, on the other hand, advances reasons to prove that the former is not absolutely certain. My friend, Mr. J. Frazer, LL.D.,

* "Among Cannibals," &c., 1890, p. 48.

† Trans. R. Soc. S. Australia, 1881-82 [1882] V. p. 17, note.

believes the custom to be the remnant of a forgotten religious ceremony, and herein I think he is correct.

Whilst on this subject it will not be uninteresting to notice how the general pattern of the Mika-knife and its handle, as illustrated in Lumholtz's figure, has been preserved by certain north-eastern tribes in the knives now made by them from old scrap iron, broken larger knives, shear-blades, and such like. Thanks to Mr. George Sweet, of Brunswick, Melbourne, I am able to exhibit three such from near Cooktown. The first and shortest of these has the handle formed by wrapping the blade round with a piece of turkey-red cotton, kept in its place by loosely winding string and thread round it; it is six and a half inches long. The second knife, although shorter in the exposed blade, is longer in its entirety, being seven and a half inches, but not so broad as the first knife. Here the handle is formed by wrapping round some fabric, and then apparently encasing in a native gum, which has set hard, whilst on this string has been wound very regularly, probably when the gum was warm, producing a compact and solid handle.

The third and last knife is the most interesting of the three, and is likewise the longest, being eight inches. The fabric used in this instance has been again daubed and partially covered with some gummy substance, which has set hard, as in the second instance, just described. But protruding from the base is a mass of green sheep's wool, and it is this which brings Lumholtz's illustration so forcibly before us. It will be remembered that the sheath of his Mika-knife was ornamented at the apex by a tuft of cockatoo's feathers.

Addendum.—(June 12, 1890.)—I omitted to mention that Police Trooper S. Gason states that this rite is known in the Dieyerie Tribe, around Cooper's Creek, about 630 miles north of Adelaide, as the "Koolpie." It is performed on youths as soon as the beard is sufficiently grown to admit of the ends being tied. The man to be operated on is rendered helpless, and the penis

laid on a piece of bark. An incision is then made with a sharp stone from the "foreskin to the base." A piece of bark is then placed over the wound and tied so as to prevent closure. [The Dieyerie Tribe of Australian Aborigines, &c., p. 21 (8vo, Adelaide, 1874).]

EXPLANATION OF PLATE.

Figs. 1-3.—Three views of Mika-knife from the Mulligan River; Mining and Geol. Mus.; Nat. size.

Fig. 1, front view;

Fig. 2, edge view;

Fig. 3, section.

Fig. 4.—Knife generally resembling the above made by existing natives around Cooktown. Coll. Sweet, Melbourne. Somewhat reduced.

Fig. 5.—Edge view of same.

HAS MAN A GEOLOGICAL HISTORY IN AUSTRALIA

BY R. ETHERIDGE, JUN., &C.

(PALEONTOLOGIST TO THE AUSTRALIAN MUSEUM, AND GEOLOGICAL
SURVEY OF N.S. WALES.)

(PLATE XI, figs. 6-7).

The question has frequently presented itself—Are there any geological traces of man on this Continent, such as exist in other countries, and whereby the presence of a former race, or the antiquity of the present fast disappearing one, can be traced? The answer given by those most competent to judge is—No!

Let us examine the evidence on which this opinion is based. The late Mr. R. Brough Smyth, in his excellent work, "The Aborigines of Victoria," says: "It is remarkable that no stone hatchet, chip of basalt, or stone knife has been found anywhere in Victoria except on the surface of the ground or a few inches beneath the surface. It is true that fragments of tomahawks and bone needles have been dug out of *Mirrn-yong* heaps on the sea-coast, covered wholly or partially by blown-sand; but though some hundreds of square miles of alluvia have been turned over in mining for gold, not a trace of any work of human hands has been discovered. Some of the drifts are not more than three or four feet in thickness (from the surface to the bed-rock), and the fact that no Aboriginal implement, no bone belonging to man, has been met with, is startling and perplexing."*

Mr. Smyth adds: "Within quite recent periods . . . large rivers, like the Snowy River in Gippsland, have in some places changed their beds. . . . Such old beds and channels have been completely dug over by gold miners, and the detritus and

* Vol. I., 1878, p. 364.

débris have been washed ; but, as far as I know, there has not been recorded any discovery of native implements. In much older gravels, clays, and sands underlying Recent Volcanic rocks, where occur fossil fruits belonging to genera now found only in the northern parts of Australia, the miner has carried his explorations ; but nothing belonging to man has been seen. More recent deposits, in which are imbedded trunks of trees, and where the cones of the *Banksia*, leaves of several species of eucalypta, and remains of marsupials are of common occurrence, are likewise barren. The tracts where, over a large area, volcanic ash, some thirty or forty feet in thickness, overlies a grass-clad surface once trod by the native dog, and on which his bones are found, retain no trace of the native. Even the caves which have been explored exhibit no other than very recent evidences of the existence of man."*

Another writer, the Rev. P. MacPherson, M.A., of equal authority, arrives at much the same conclusion, for after fully discussing the question for and against, he concludes by saying :

tomahawk, which is referred to by Mr. C. S. Wilkinson* in the following words :—"No human remains have yet been found with the bones of the extinct animals, but a stone hatchet has been obtained on the Bodalla estate, in the alluvium, at a depth of 14 feet from the surface."

The next case came under the personal observation of the Government Geologist and the writer. Mr. C. S. Wilkinson, when making a geological survey of the Cape Otway coast, in Victoria, in 1864, found in the sand dunes, two miles east of the Cape Otway light-house, flint chips, a sharpened stone tomahawk, and several bone "needles." The writer, a year or two later, obtained near the same locality a similar bone spike in a mixture of beach material, pebbles, and broken shells resting on the Mesozoic Carbonaceous Sandstone forming the high cliffs of the Cape, and apparently intermediate between that deposit and the overlying dunes.† "Remains of this nature, lying as they did beneath sand dunes at least two hundred feet high, must have been of great antiquity."‡

The method employed by the aboriginals to sharpen their stone tomahawks is too well known to need description, but the following curious passage occurs in Bennett's "History of Australian Discovery and Civilisation: §—"In sinking wells and other excavations in the Hunter Valley, flat rocks with these axe-marks on their surfaces have been discovered at the depth of thirty feet or more below the present surface level, and covered with a drift or alluvium which in all probability must have taken thousands of years to accumulate."

Lastly, the late Mr. James Bonwick states that at Ballarat a basaltic "stone weapon, or tool-head, was unearthed during the

* "Notes on the Geology of New South Wales" (Dept. Mines, Sydney), 1887, p. 90 (4to, Sydney, 1887, Government Printer, 11a 64-87).

† Trans. R. Soc. Vict. 1876, xii. p. 3.

‡ Records Geol. Survey, N. S. Wales, 1889, I. pt. 1, p. 15.

§ P. 263 (8vo, Sydney, 1867).

process of gold-prospecting twenty-two inches below the surface; in a place which evidently had never been before disturbed."^{*}

The gathering of Post-Tertiary deposits is of so variable a nature that the deductions of relative age, of any value, except under peculiar circumstances, cannot be drawn from their physical features. Indeed this line of argument has been adopted by the Rev. Peter MacPherson, who, when dealing with the antiquity of aboriginal stone hatchets, selected the Hunter River alluvium for one of his illustrations, showing how easily and quickly it is possible for detrital matter to entomb articles of human workmanship.[†]

We now come to what would at first sight appear to be the most reliable evidence of the geological antiquity of Australian man, but after a careful weighing of the facts, I do not feel justified in attaching to it that amount of importance which the discovery would seem to warrant. I refer to the important statement by the late Gerard Krefft, which he published on at least two occasions, of the occurrence of a human tooth in the Wellington Cave breccia.

I need not dilate on the importance of such a find, if its surroundings can be satisfactorily established. If the tooth, which I am now permitted to exhibit by permission of the Curator of the Australian Museum, was found in the well-known red bone-earth or breccia associated with any of the mammals of that period now extinct, it certainly would lend strong colour to the existence of man on this Continent in Post-Tertiary times. To prove this the evidence must be conclusive, not partial; and I regret to say there is just a sufficient want of corroborative evidence, Mr. Krefft's statement notwithstanding, to neutralise the importance of the discovery.

The facts of the case, such as they are, are as follows:—The late Curator of the Australian Museum, in giving a list of the

^{*} "Daily Life and Origin of the Tasmanians," 1870, p. 215.

[†] Journ. R. Soc. N. S. Wales for 1885 [1886], xix. p. 117.

Wellington Cave fossils in the "Guide to the Australian Fossil Remains exhibited by the Trustees of the Australian Museum, &c.,"* mentions "the fractured crown of a molar tooth, probably a human molar." The second notice occurs in a paper, "Further Discovery of Remains of a Great Extinct Wingless Bird in Australia," wherein he says—"I have found the fractured crown of a *human molar* in the same matrix as *Diprotodon* and *Thylacoleo*, at Wellington, in this colony."†

Thanks to the care manifested by Mr. Henry Barnes, at the Australian Museum, of all the Wellington gatherings, the specimen was forthcoming on enquiring for it. That it is the crown of a human molar is, I think, beyond much doubt; but to guard against mistake I placed the specimen in the hands of Mr. P. R. Pedley, who corroborates Mr. Krefft's determination, and further suggests that it is probably of the upper right series. Minute portions of the red cave earth are still adhering to it, but if the tooth ever existed in a block of the breccia, with bones of the extinct marsupial mentioned by Krefft, it has long been removed from such. We have the testimony of Mr. Barnes that the tooth was found at Wellington in the No. 3, or Mitchell's Breccia Cavern, by Mr. Krefft in person, the former having been present at the time. On the two most important points, however, Mr. Barnes' memory, after this lapse of time, is defective. Was the tooth actually found in a block of breccia with the remains of *Diprotodon* and *Thylacoleo*?, or simply lying loose on the floor of the cave?, Mr. Krefft's expression in relation to these animals having perhaps only been used in a figurative sense. In the answers to these questions lies the solution of the problem. If associated in a block of breccia with *Diprotodon* and other similar remains, it must be admitted that strong evidence exists of the presence of man at the time *Diprotodon* and *Thylacoleo* roamed abroad. On the other hand, if merely a floor specimen, it may have entered the cave in a fortuitous manner, and in such a case

* 8vo, Sydney, 1870, p. 3.

† Geol. Mag. 1874, I. p. 46.

must be looked upon as very poor evidence. The value of this tooth is not increased by the fact that no other human remains have been found in the Wellington Caves under similar circumstances, so far as the writer is aware, although portions of a human skeleton, said to be that of a gin, were found in No. 2 Cave by Mr. Henry Barnes. I am assured by the latter that these were not fossil, and are probably those referred to by Mr. Krefft in the second edition of his "Australian Vertebrata, Recent and Fossil,"* wherein he says—"Bones of the extremities found in a cave at Wellington, being left and right femur, left and right tibia, left and right humerus, portion of fibula." It is, however, strange that Krefft, in the third edition of the same work, published in 1871,† says nothing about the molar or the gin's bones, merely remarking, "Of man we have but scanty evidence regarding the length of his existence here; in not one instance were weapons or implements obtained with the remains of fossil animals."

It will be seen from this that the later remarks of Mr. Krefft himself do not tend to strengthen the view that the tooth in question is worthy to take its place as evidence of man's existence then, in the same manner that the bones of *Diprotodon* and *Thylacoleo* do of these animals.

The molar consists of about two-thirds of the crown broken off from the remainder of the tooth, the under surface exposing the fractured dentine. The entire crown is so much worn down as almost to reach the alveolar border. Regarding the tooth as an upper right molar, the two inner cusps are almost worn away, leaving the sulcus dividing them now, as a ridge. The inner anterior cusp is the portion broken away, the inner posterior

* "Australian Vertebrata (Recent and Fossil) representing all the Genera known up to the present time, With Notes," by Gerard Krefft. *Cat. Nat. Industrial Prods. N. S. Wales, Paris Univ. Exhib.* 1867, p. 91 (8vo, Sydney, 1867. By Authority.)

† "Australian Vertebrata, Fossil and Recent." *Industrial Progress of N. S. Wales*, Part 3, 1871 (8vo, Sydney, 1871. By Authority), p. 2.

being ground quite flat. The outer cusps are worn almost into concavities exposing the dentine, the enamel forming a ring or wall round the inner margin.

The tooth appears to be completely fossilised, for on comparing it with the teeth of the larger marsupials from the Wellington Caves, the mineral condition is without question similar.

To sum up, it may be fairly stated:—(1) That up to the present, as at the time Mr. R. B. Smyth wrote, the existence of man's works in any geological deposit above question, has not been shown to exist. (2) That the molar crown found in the Wellington Breccia Cave appears to be that of a human being, and is to all intents and purposes a fossil. (3) That its position in the cave and association with the other organic remains there entombed is open to doubt. (4) That no other human remains have been found at Wellington under similar conditions.

The mineralised condition of the tooth is, of course, its strongest recommendation; but I do not think that, in a momentous question of this kind, and one on which so much theory can be built up, this should be allowed to outweigh other evidence pointing in a different direction.

The matter can hardly be summed up better than by the very reasonable and often correctly applied Scotch verdict of "Not proven."

In conclusion, I would distinctly wish it to be understood that I have not lost sight of the bearing the relative antiquity of the Tasmanian aborigines has on this subject. The former geological connection of Australia and Tasmania now appears to be a generally accepted fact.* The late Mr. James Bonwick regarded the Tasmanians as an older race than the Australians, although emanating from a common centre, and dispersed over a then existing continent of which our present Australia and Tasmania formed portions. If such be the case, how vast a period of time must have elapsed since then, allowing for the formation of the

* J. Bonwick—"Daily Life and Origin of the Tasmanians," 1870, p. 259.

channel we now know as Bass' Straits; and herein lies one of the strongest proofs of man's early existence on the Island Continent of Australia. Notwithstanding this, however, there remains the undoubted fact that we still lack trustworthy geological information of the approximate date of his first advent in Australia.

Addendum.—I omitted to mention the only other reference known to me, which can have any possible bearing on man's connection with our extinct gigantic fauna. I refer to the discovery which the late Rev. J. E. T. Woods believed he had made of the scraped and cut bones of an extinct bird termed by him *Dromaius australis*, and with which he supposed the Aborigines to have been co-existent. (See Mr. Woods' "Report on the Geology of the South-Eastern District of the Colony of South Australia, 1886," p. 7; "Nat. History of N. S. Wales—An Essay," 1882, p. 37; Proc. Linn Soc. N. S. Wales, 1883, VII. p. 387). As, however, but meagre details are given, no figures, and as I have been unable to satisfactorily trace the bones, this possible evidence cannot at present be traced further.

EXPLANATION OF PLATE.

Fig. 6.—Human Molar from cave breccia, Wellington; crown view; $\times 2$
Australian Mus.

Fig. 7.—The same; side view; $\times 2$.

NOTES AND EXHIBITS.

Mr. Maiden exhibited specimens of the three following interesting new plants recently obtained by Mr. F. M. Bailey, Government Botanist of Queensland, at Mt. Bellenden-Ker and described by him in his Official Report :—Leaves and fruit of *Helicia Whelani* ; portion of stem, leaves, and fruits of *Ficus crassipes* ; and leaf and fruits of *Strychnos Bancroftiana*. Also seeds of *Seseli Harveyanum*, F.v.M., (Umbelliferæ), from the Snowy Mts., used locally as a substitute for caraways ; and a sample of a series of artificial flowers made in Germany under scientific supervision with the object of supplying botanical students and others with life-size reproductions of living specimens.

Mr. Etheridge exhibited the aboriginal knives referred to in his paper.

The Hon. James Norton communicated, and made some remarks upon, a letter from Mr. Fred. Turner giving particulars respecting a plant of *Pavonia hastata* now growing in Hyde Park, which has produced both normal and cleistogamous flowers, the latter giving rise to fruit-carpels as numerous and well developed as those succeeding normal flowers.

Mr. Olliff exhibited the supplementary index to Mr. Whymper's "Travels amongst the great Andes of the Equator," containing an account of the Coleoptera obtained during the expedition, and he drew attention to the special excellence of the woodcuts of the insects therein described.

Mr. Skuse exhibited a large collection of Diptera which had been recently made by Mr. R. Helms at Dunoon, Upper Richmond River, N.S.W. The greater part of the collection consisted of *Nematocera*, belonging to the families Cecidomyidæ, Sciaridæ, Mycetophilidæ, Bibionidæ, Culicidæ, Chironomidæ, Psychodidæ, Tipulidæ, Dixidæ, and Rhyphidæ, the majority of the species

represented being new. Among the Tipulidæ, of which specimens of about forty species were obtained, there are several new and remarkable forms, including *Limnobia* (sensu stricto), *Dicranomyia*, *Thrypticomys*, *Geranomyia*, *Libnotes*, *Orimarga*, *Molophilus*, *Trimicra*, *Conotia*, *Limnophila*, *Gynoplistia*, *Habromastix* and *Macromastix*.

Also a very extensive collection of Diptera received from the Queensland Museum for descriptive purposes; specimens of *Eristalis tenax*, Linn., and *Gastrophilus equi*, Fab., from New Zealand; and a specimen of the gall of the Coccid *Brachyscelis munita*, Schrader, found on *Eucalyptus robusta*, Sm.

WEDNESDAY, 28TH MAY, 1890.

The President, Professor Stephens, M.A., F.G.S., in the Chair.

Mr. Duncan Carson, Sydney, was elected a member of the Society.

DONATIONS.

"Berliner Entomologische Zeitschrift." XXXIV. Band (1890);
'Stettiner Entomologische Zeitung.' 50 Jahrg., Nos. 10-12
(1889). *From Sir William Macleay, F.L.S., &c.*

"Annual Report of the Geological and Natural History Survey
of Canada." New Series. Vol. III. (2 Parts), 1887-88; with
Maps, &c. *From the Director.*

"Proceedings of the United States National Museum." Vol.
XII. (1889), Nos. 773-781 and 787 (advance sheet). *From the
Museum.*

"The Journal of Comparative Medicine and Veterinary
Archives." Vol. XI., No. 3 (March, 1890). *From the Editor.*

"The American Naturalist." Vol. XXIII, Nos. 266 and 274;
Vol. XXIV., Nos. 278-280. *From the Editors.*

"United States Department of Agriculture; Division of
Entomology — Insect Life." Vol. II., Nos. 1-9 (1889-90);
"Bulletin," Nos. 20 and 21 (1889-90). *From the Secretary.*

"Annual Report of the Canadian Institute, Toronto, Session 1888-89." *From the Institute.*

"Catalogue of the Fossil Reptilia and Amphibia in the British Museum (Nat. Hist.)." Part III. By R. Lydekker, B.A., F.G.S., &c.; "A Guide to the Mineral Gallery" (1889). *From the Director.*

"A Naturalist among the Head-Hunters, being an account of three visits to the Solomon Islands in the years 1886, 1887 and 1888." By Charles M. Woodford, F.G.S., &c. *From the Author.*

"Bulletin de la Société Royale de Géographie d'Anvers." Tome XIV., Fasc. 1 (1890). *From the Society.*

"Mémoires de la Société Zoologique de France pour l'Année 1889." Tome II., No. 2. *From the Society.*

A Pamphlet entitled "Liquid Kino." By J. H. Maiden, F.L.S., &c. *From the Author.*

"Zoologischer Anzeiger." XIII. Jahrg., Nos. 331 and 332 (1890). *From the Editor.*

"Memoirs of the Geological Survey of India.—Palæontologia Indica." Ser. XIII., Vol. IV., Part 1 (1889). *From the Director.*

"Records of the Australian Museum." Vol. I., No. 2 (1890); "Catalogue of the Australian Birds in the Australian Museum, Sydney. Part I.—Accipitres." By E. P. Ramsay, F.L.S., C.M.Z.S., &c. *From the Trustees.*

"Proceedings of the Asiatic Society of Bengal, 1889." Nos. vii.-x. (July-Dec.); "Journal," n.s. Vol. LVIII., Part i., No. 2; Part ii., Nos. 3 and 4, and Supplements Nos. 1 and 2 (1889). *From the Society.*

"The Ethnography of the Western Tribe of Torres Straits ;"
"Legends from Torres Straits, No. i." By Professor A. C.
Haddon. *From the Author.*

"Feuille des Jeunes Naturalistes." No. 234 (April, 1890).
From the Editor.

"The Perak Government Gazette." Vol. III., Nos. 10 and 11
(April, 1890). *From the Government Secretary.*

"Annales de la Société Belge de Microscopie." Tome XIII.,
Fasc. 3 (1890). *From the Society.*

"Reports of the Commissioners of Fisheries for New South
Wales on the Fisheries of the Colony, 1883, 1886 and 1888 ;"
"Report on the Worm Disease affecting Oysters on the Coast of
N.S.W." By T. Whitelegge, F.R.M.S. *From the Commissioners.*

"Abstract of Proceedings of the Zoological Society of London,
1st April, 1890." *From the Society.*

"Johns Hopkins University Circulars." Vols. I. (Nos. 1, 3-11,
13-18); II. (Nos. 19-26); III. (Nos. 27-32); IV. (No. 42); V.
(Nos. 46, 48 and 51); IX (Nos. 79 and 80), 1879-90. *From the
University.*

"Bulletin of the Museum of Comparative Zoology at Harvard
College, Cambridge, U.S.A." Vol. XVI., No. 7 ; Vol. XVIII.;
Vol. XIX., No. 1 (1889-90). *From the Curator.*

"Proceedings of the California Academy of Sciences." 2nd
Series, Vol. I. (2 Parts), 1888-89 ; "Memoirs." Vol. II. No. 2
(1888). *From the Academy.*

"Proceedings of the Academy of Natural Sciences of Phila-
delphia, 1889." Part I. *From the Academy.*

"The Journal of the Cincinnati Society of Natural History." Vol. XII., No. 1 (1889). *From the Society.*

"Mittheilungen des Vereins für Erdkunde zu Leipzig, 1888." *From the Society.*

"Verhandlungen der k.k. zoologisch-botanischen Gesellschaft in Wien." XXXIX. Band, Parts 1 and 2 (1889). *From the Society.*

"Mémoires de l'Académie Impériale des Sciences de St. Pétersbourg." vii. Série, Tome XXXVI., Nos. 14-16 (1889). *From the Academy.*

NOTES ON AUSTRALIAN ECONOMIC BOTANY.—No. I.

BY J. H. MAIDEN, F.L.S., &c.

(CURATOR OF THE TECHNOLOGICAL MUSEUM.)

I propose, under this heading, to give, from time to time, brief notes on the products and uses of some of our native plants. They are selected from a large quantity of supplementary information which I have gathered together since the publication of my "Useful Native Plants of Australia" over a year ago.

FOODS.

DRIMYS AROMATICA, *F.v.M.*, and D. DIPETALA, *F.v.M.* N.O. Magnoliaceæ.

Both these trees are known locally as "Pepper-trees." The dried fruits of *D. aromatica* are black, rather shrivelled, sub-globular, with short stalks, and much resembling cubebs in appearance, except for the minute brown scars (varying from one to six or more). They break down readily under the teeth, forming a gritty powder, but in a very short time they burn the tongue and roof of the mouth severely. They are very acrid, with a flavour like allspice, only much more intense. The leaves and bark also have a hot, biting, cinnamon-like taste. The bark, leaves, and fruit are, as is well-known, sometimes used by country people as a substitute for pepper. The barks of these two species are being tested for their medicinal properties.

D. aromatica finds its most northern extension on the Sugar Loaf Mountain (Braidwood), and perhaps a trifle more north in the Clyde Mountains,—though it has not yet been seen north of the Sugar Loaf Mountain. Near our southern boundary, and especially in the Gippsland ranges, it attains its greatest height and diameter in the jungle, where it is often found as a small

handsome tree about 20-25 feet high and from 4 to 6 inches in diameter. On the slopes of the Snowy Mountains it sometimes forms dense jungles which are there called "Pepper Scrub." It ascends to an altitude of more than 6,000 feet, but is then always shrubby.

D. dipetala is a small gully-tree which bears a considerable quantity of fruit of a plum colour up to nearly black when fully ripe. They are in shape like a roly-poly, and I have measured them up to $1\frac{1}{4}$ inch full by $\frac{3}{4}$ inch in diameter. They are succulent, and may be eaten with impunity, tasting like a nearly insipid apple, but the few small black seeds which they contain, which are from pear- to kidney-shaped, are exceedingly pungent, tasting like *D. aromatica* fruits if chewed. I have not heard of the blacks eating them, but it is not possible they could have ignored them.

The present species is not so well-known as *D. aromatica*, nor has any use been made of either bark, leaves, or fruit. The ripe fruit, when bruised and steeped in hot water, makes a beautiful dark red to purple liquid, a teaspoonful of which added to a glass

The elevation of the locality (now its most southern range) is from 1,500 to 2,000 feet, which is the same as its elevation on the Cambewarra Mountain. It is perhaps worthy of remark that the two species, both the northern and southern, should meet and find their respective limits pretty well in a line east and west, and that *D. aromatica* should not descend to the level of *D. dipetala*.

A parallel case occurring in the same region is furnished by the two species of *Telopea*. Neither *D. dipetala* nor *Telopea speciosissima* crosses over from the sandstone to the granite, nor do *T. oreades* and *D. aromatica* cross from the granite into the sandstone. And it is also remarkable that the two southern species, as they proceed further and further south, attain the size and their greatest perfection in the same locality, just across the boundary in the Gippsland ranges.

MARSDENIA FLAVESCENS, *A. Cunn.*, and *M. VIRIDIFLORA*, *R.Br.*
N.O. Asclepiadææ."

It was the Rev. Dr. Woolls who first drew attention to the fact that the tuberous roots of these species are edible. They are called "Native Potatoes," and the blacks were accustomed to eat them after some preparation. They are probably referred to in the following account of Captain Hunter's Expedition up the Hawkesbury, July 1788.

"On the banks here we also found yams and other roots, and had evident marks of the natives frequenting these parts in search of them for food. They have no doubt some method of preparing these roots before they can eat them, for we found one kind which some of the company had seen the natives dig up, and with which being pleased, as it had much the appearance of horse-radish, and had a sweetish taste, and having swallowed a small quantity, it occasioned violent spasms, cramps in the bowels, and sickness of the stomach ; it might probably be the caçada root." (*Historical Journal*, p. 153.)

Solanum nigrum, Linn. N.O. Solanaceae.

This common weed is stated in the Flora to have been probably introduced in some of the Australian localities, with cultivation. Baron Mueller includes it in his second Census, so that this is the latest authoritative pronouncement of its being an Australian native. "The berries are said by several Australian collectors to be frequently eaten." (B.Fl.) My own children have been detected eating them on several occasions, but never, apparently, with evil effects. In the Richmond River district they are known as "Native Currants," and Mr. Hagman informs me that the fruits are used for making jam in the locality. The leaves were cooked as a pot-herb by the camp followers of Dr. Aitchison in Afghanistan. (*Trans. Linn. Soc. Lond.* [2]. Bot. iii., Pt. i., 9 & 91).

FODDER PLANTS.

Acacia implexa, Benth. N.O. Leguminosae.

In Southern New South Wales, near Delegate, cattle have been known to eat the leaves of this tree, stripping off all within reach, although grass in the paddocks was abundant.

greedily eaten by cattle. Mr. Joseph Latimer states that during the last great drought he cut down the limbs of this tree for his cattle, and they would always eat the leaves of it before anything else that was given to them. This tree is found as far south as Bembooka Mountain, but there are only a few trees of it there, whereas at Mt. Dromedary, a few miles further north, it is plentiful, and there attains a diameter of about 15 inches.

BERTYA CUNNINGHAMII, *Planch.*

Called "Gooma," in Western New South Wales, according to information kindly furnished to me by Miss M. A. Clements of Palesthan.

This is another Euphorbiaceous plant. It is a fodder shrub which has no chance of making head-way where sheep feed, and in spite of the poisonous natural order to which it belongs, there is no record of its having proved deleterious to animals. It has a pleasant, bitter flavour.

BORONIA MICROPHYLLA, *Sieb.* N.O. Rutaceæ.

A specimen of this plant was sent to me from Katoomba, labelled "Mountain Hopbush," with the information that stock are fond of it.

DYE.

Australia is so poorly endowed with vegetable dye-stuffs that I draw attention to the tinctorial properties of the yellow powder which surrounds the seeds of various species of *Lomatia*, particularly *L. ilicifolia*, R.Br. The matter has been brought under my notice by Mr. Bäuerlen, the painstaking collector for the New South Wales Technological Museum, and is being subjected to careful examination. The powder colours water, and stains the fingers, particularly if washed with soap, since alkalies darken it; the substance being, in this respect, similar in its behaviour to turmeric. The substance can never have more than a purely scientific interest.

PERFUMES AND ESSENTIAL OILS.

CERATOPETALUM APETALUM, *D. Don*. N.O. Saxifragæ.

The bark smells very strongly of Coumarin, and a small slab of this is therefore useful for scenting linen presses, &c. I announced the isolation of Coumarin two years ago, and Messrs. Schimmel and Co., of Leipzig, the celebrated essential oil firm, have confirmed my observation. (*Bericht*, April 1890, p. 51).

EUCALYPTUS MACULATA, *Hook.*, var. *CITRIODORA*. N.O. Myrtacæ.

The "Citron-scented Gum."

I wish to draw attention to the enterprise of Mr. A. Jefferies Timbury, a pharmaceutical chemist of Gladstone, Queensland, who is pluckily entering into the preparation of this oil. Besides the ordinary commercial oil, he makes a refined or rectified article of great elegance. While it has the well-known odour of Citronella oil, there is at the back of it a delicious turpentinous odour; and my feeling in regard to this Australian product is this (apart from its use as a simple perfume for soap, &c.), that in cases in which the use of Eucalyptus oil is desirable, people may now have the option of a sweet-smelling article, though the perfume of ordinary Eucalyptus oil (*amygdalina*, &c.), is by no means disagreeable. It is small credit to the scientific men of Australia that the first complete chemical investigation of this Australian oil (*citriodora*) has been made at Leipzig in Germany.

SUBSTANCES REPUTED MEDICINAL.

DORYPHORA SASSAFRAS, *Endl.* N.O. Modimiacæ.

The bark of this "New South Wales Sassafras" is used as tonic medicine. Dr. T. L. Bancroft, of Brisbane, obligingly informs me that he has tried it on frogs, and found it to be inert. The same observer also writes that the bitter bark of *Geijera salicifolia*, Schott, N.O. Rutacæ, a "Wilga," is physiologically inert, or practically so. He makes a similar observation in regard to the *Goodenias*, and also in regard to *Gratiola pedunculata*, R. & S.

and *G. peruviana*, Linn., plants belonging to the Scrophularinæ, which are often used in domestic medicine.

LOBELIA PURPURASCENS, R.Br. N.O. Campanulacæ.

This plant was sent to me (July 1889), from Port Macquarie, as "a newly discovered antidote to snakebite." Mr. Hamlet (Government Analyst, Sydney), and I have both found the oily alkaloid Lobeline in it. Dr. T. L. Bancroft kindly informs me that this species "contains the same active properties as *L. inflata*, and might be used as a substitute for it." The chemical experiments are thus confirmed by physiological ones. The North American *L. inflata* is collected after the seed-capsules have become inflated. It is emetic and expectorant, and its chief use is in asthma.

PETALOSTIGMA QUADRILOCULARE, F.v.M. N.O. Euphorbiacæ.

"Quinine tree, &c."

Dr. T. L. Bancroft informs me that the bark of this tree is physiologically inert, or practically so. He makes a similar observation in regard to the *Pittosporums*, and in regard to the well-known bitter bark of *Tabernæmontana orientalis*, R.Br., belonging to the Apocynæ.

ON A NEW AUSTRALIAN COCCID.

By W. M. MASKELL, F.R.M.S.,
CORR. MEMB. ROY. SOC. SOUTH AUSTRALIA.

(Communicated by A. Sidney Olliff, F.E.S.)

(Plate xv.)

Group MONOPHLEBIDÆ.

Genus CÆLOSTOMA, Maskell.

Adult female with antennæ of eleven joints: body segmented: rostrum and mentum entirely absent in adult stage: anal tubercles absent or inconspicuous: feet not fossorial.

Adult male with faceted eyes. Abdomen without lateral tassels.

gestation active, naked, or covered with thin white meal which sometimes appears like short cotton at the posterior end. Antennæ tapering, with eleven joints: the joints are all nearly equal, and somewhat hairy. Feet rather thick: tibia and tarsus fringed on the inner side with strong spiny hairs: upper digitules very short, lower pair represented by a short, stiff, seta: claw slender: femur rather thick. Anogenital ring apparently absent, but a simple transverse orifice, with a smaller one on each side of it, may be detected at the anal extremity. Rostrum and mentum entirely absent, but there seems to be an orifice between the first pair of feet, situated in a deep corrugation of the ventral skin. After treatment with caustic potash the skin is seen to be marked with a great number of oval, semi-translucent cells, in the middle of each of which is a small brown cone bearing a minute orifice at the top. Anal tubercles absent.

Adult male dark red, the wings bluish-purple with red nervures. Length of body about $\frac{1}{3}$ inch; expanse of wings nearly $\frac{2}{3}$ inch. Eyes large, faceted. Antennæ of ten joints, the first two short, the next four rather long and slender, the rest somewhat shorter: there are no nodosities on the joints, but numerous very short hairs on each. Haltere very large, ovate, bearing a single curved seta at the end. Abdomen distinctly segmented: no lateral tassels. From the last three segments but one there spring, dorsally, a number of white, glassy, delicate, straight filaments, coalescing to form a brush-like tail which in some specimens is nearly three times as long as the body. The last segment terminates in a short, conical spike from which protrudes the penis. Feet long, slender: digitules very short and fine.

Hab.—On *Angophora* sp., Sydney, N. S. Wales. I am indebted to Mr. A. Sidney Olliff for specimens of adult males and females, obtained by him in January, as also for the opportunity of describing the species.

This very large and handsome insect is clearly distinct, not only in the colour and skin-markings of the female, but also in the peculiar "brush" of the male. I have not seen either the larva

or the second stage. The former, in all probability, will not greatly differ from those of other Monophlebids, except perhaps in colour. No writer that I know of has described the second female state of any foreign Monophlebid except *Icerya* and, doubtfully, *Drosicha*, and yet this would be exceedingly interesting. In the case of the New Zealand species of *Cælostoma*, as far as they are known, the second stage is found in thick, waxy cases or "testa," either above or under ground. It is likely that the same would occur with *C. australe*, though the variation of Coccids are so curious that nothing can be predicated certainly on the point. As this is the first species of the genus found outside New Zealand, I have thought it best to attach to it the name *australe* more especially as, from its active habit in the adult state and from the absence of a rostrum, it would not be easy to ascribe to it any particular food-plant.

EXPLANATION OF PLATE.

Cælostoma australe.



NOTES ON THE LIFE-HISTORY OF CERTAIN SAW
FLIES (GENUS *PERGA*), WITH DESCRIPTION
OF A NEW SPECIES.

BY W. W. FROGGATT.

In the spring of last year I commenced collecting such larvæ of saw-flies (*Perga*) as were obtainable in the neighbourhood of Sydney with the view of investigating their life-history. Not then sufficiently understanding their habits the earliest batches obtained died prematurely. From other broods, however, collected at Botany and at Rose Bay, saw-flies referable to four species were reared; and these were supplemented by three other species bred from a consignment of larvæ sent me from Nundle, N.S.W., by my father.

Though several species in their natural state confine themselves to particular species of Eucalypts, in captivity all my specimens fed freely on the leaves of *Eucalyptus corymbosa*, one of the commonest Sydney gum-trees. A large jar with about six inches of sand and rotten wood on the bottom serves very well as a breeding-cage; and in such a jar with its aperture closed the leaves kept fresh for at least two days. Messrs. Bennett and Scott in their account of *Perga eucalypti* (P.Z.S., 1859, p. 209) state that the larvæ live on *Callistemon* as well as *Eucalyptus*. So far I have not myself met with them on any plant but Eucalypts.

The larvæ of each brood cluster together during the daytime, but at night they separate to feed. Several times just about day-break I have come upon them while scattered, but they soon hurried back to their social clusters.

The cocoons of some species are collected into masses, while of others each cocoon is separate and distinct. Their construction is rather remarkable, for at one end of the cocoon is a second small

cell in which the last moulted larval skin is left, and this is partitioned off from the main chamber in which the metamorphosis is undergone by a lid perforated with numerous fine passages. The perfect insects of species which construct aggregates of cocoons emerge at this end, but those of species forming isolated cocoons make their exit through the side of the cocoon.

The following seven species have been bred by me from larvae kept at Elizabeth Bay.

1. *PERGA DORSALIS*.

Perga dorsalis, Leach, Zool. Misc. (1817) III. p. 117, ♂; Westw. P.Z.S. 1880, p. 262; Kirby, B.M. List of Hymen. (1882), I. p. 18.

♀. *P. scutellata*, West. in Griff. Anim. King. Ins. pl. 76, fig. 2, and pl. 106, fig. 3, Vol. II. pp. 402, 792.

P. eucalypti, Benn. & Sc. P.Z.S. 1859, p. 209 (Annulosa),

hatched out ten were females and two males. All the measurements of the larvæ and perfect sawfly agree with those given by Messrs. Bennett and Scott of their *P. eucalypti*, and I have not the least doubt that Professor Westwood is right about its being only a synonym.

1. PERGA POLITA.

Perga polita, Leach, Zool. Misc. III. p. 115 ; Westw. P.Z.S. 1880, p. 363.

This species has been taken at Tasmania, Melbourne, Hunter River, and Moreton Bay, and has no doubt a wider range. Leach's type is in the Macleay Museum.

Larvæ: black, covered with short white hairs, the legs, shoulders, and tip of abdomen yellow. Length, $1\frac{1}{2}$ inches.

I received the larvæ of this species from my father, who sent them by post from Nundle, N.S.W.; they arrived in good condition on September 23rd. Taken on a eucalypt, locally known as the "white gum;" they readily devoured the leaves of *E. corymbosa*; and on the 10th October betook themselves to the sand, burrowing down to the bottom of the jar, where they formed isolated cocoons, which, covered with particles of sand, were easily overlooked unless the sand was carefully examined. A solitary individual came out on the 20th December, but no more emerged until 5th January, when two more made their appearance, all these being males. No more coming out I examined the remaining cocoons, and found them all tenanted by dipterous larvæ (Fam. *Tachinidæ*).

3. PERGA CHALYBEA, n.sp.

Head: antennal tubercle, two marks between the antennæ, labrum and outer margins of eyes yellow; jaws, eyes, and vertex black; thorax black, rugose, densely punctured, pronotum yellow, fore and middle legs yellow, hind legs with apical half of femora,

tibia and tarsi, with the exception of base of first tarsal joint, black; a large irregular white mark on the side of the mesothorax; metathorax shining blue black; scutellum white, bisected in the centre by a black impressed line; abdomen bright shining blue, second and following segments marked on the outer margin with triangular white marks, anal segment white, under side luteous grey; wings vitreous, costa, stigma, and nervures ochreous. Exp. fore-wings 12 lines; corp. 7 lines.

Hab.—S. Australia (one ♂ specimen in Macleay Museum); Nundle, N.S.W. (larvæ).

This species comes near *P. dahlbomii*, Westw., and belongs to Section ii. of Kirby's Classification.

Larvæ: black, densely covered with white hairs, the legs and tip of abdomen yellow. Length $1\frac{1}{2}$ inches.

The larvæ were received at the same time and from the same locality as in the preceding case. They constructed the same sort of cocoons as the previous species, and were about the same time undergoing their metamorphosis. Five specimens all males.

4. PERGA LEWISII.

Perga lewisii, West. Trans. Ent. Soc. Lond. I. p. 234, and Proceedings II. p. XLIV.; Arcan. Ent. I. p. 23, pl. 7, fig. 1; P.Z.S. 1880, p. 374.

An interesting account of this species is given by Professor Westwood from information supplied by Mr. R. H. Lewis, who noticed the remarkable habit of the female's watching over her young for a month or six weeks after they are hatched; but he did not record much about their metamorphosis.

Larvæ: dirty brown, covered with short brown hairs, the legs and last segment of abdomen pale yellow. Length 17 lines.

My specimens of larvæ all came from Nundle. They were said to live on saplings of the "stringy bark," but fed freely on our common gum leaves. They cast their skins twice, and on 10th

October instead of burrowing into the sand crawled under the bits of rotten wood on the top of the sand, and attached their cocoons to them. The first two came out on 9th December, but no more appeared until January 21st when some thirteen hatched out during the week. The male of this species is I believe unknown; all my species were females, and though there are some thirty specimens among the Macleay collection duplicates they are all of the same sex.

5. PERGA LATREILLEI.

Perga latreillei, Leach, Zool. Misc. III. p. 116; Westw., P.Z.S., 1880, p. 372, pl. xxxvi. fig. 3.

♀. *Perga spinolæ*, Westw., P.Z.S., 1880, p. 371, pl. xxxvi. fig. 4.

Larvæ: pale brown, more slender than usual, the posterior segments tinged with dark brown. Length 14 lines.

From this bunch of larvæ, which certainly contained only one species of larvæ, I bred the two above species; so it is evident though they are not quite alike, that *P. latreillei* must be the male, of *P. spinolæ*, as the specimens of *P. latreillei*, two in number, were both males, while of the latter there were nine, all females; on turning to Westwood's Monograph I found that the female of *P. latreillei* is unknown, and that the female only of *P. spinolæ* has been found. The larvæ were found at Rose Bay on November 19th feeding on *Eucalyptus corymbosa*. They disappeared a week later, and finding a number of dead larvæ on the surface of the sand in their jar, I removed them, and placed the jar on one side thinking they were all dead. On February 15th I was surprised to find a saw-fly buzzing about in the jar, and on examining the contents found a mass of cocoons united together in the same manner as those of *P. dorsalis*, about two inches beneath the sand. From these cocoons were obtained nine specimens of *P. spinolæ* and two of *P. latreillei*. The latter was originally recorded from South Australia, the former from Melbourne.

6. *PERGA FÖRSTERI*.

Perga Försteri, West P. Z. S. 1880, p. 368, pl. xxxvi. fig. 1

Larvæ: uniform black without any yellow on the legs or abdomen. Length $1\frac{1}{2}$ inches.

I took a cluster of the larvæ of this species feeding on *Eucalyptus corymbosa*, at Rose Bay, on October 14th. They went into the sand three days after, making isolated cocoons at the bottom of the jar. The first one did not emerge until May 3rd and during the week six more came out; of these two were males and five females. As only the male has been described and the female differs considerably, I give a brief description. Female differs from male in having the hind portion of head and the V-shaped middle lobe of the mesonotum reddish-brown; the three posterior segments of the abdomen reddish-brown; the white markings on the sides of the abdomen much smaller; and the wings only slightly clouded at the tips.

NOTES ON AUSTRALIAN ABORIGINAL STONE WEAPONS AND IMPLEMENTS.

BY R. ETHERIDGE, JUN., &C.

(PALEONTOLOGIST TO THE AUSTRALIAN MUSEUM, AND GEOLOGICAL
SURVEY OF N. S. WALES.)

ii.—*Additional Remarks on Mika-Knives.*

(Plates XI.-XII., figs. 8, 9, 10.)

At the last meeting of the Society I described a stone knife from the Mulligan River, believed to be that used in the Mika operation, and furnished to me by Mr. H. S. W. Crummer, of the Lands Department. Since then my colleague, Mr. J. Brazier, has recalled to my notice a very complete set of these knives in the Australian Museum from North Queensland, presented by Mr. Dunlops. The chief points of interest about these knives lie in their closer resemblance to the figure given by Lumholtz*, to which reference was made in my last paper, than the knife therein described by me. This resemblance consists in the presence of bark sheaths, a wooden handle to one, and an apical ornament of bird's feathers to another.

The knives are five in number, the stone heads being all of the same type, angular in the middle line of one face, or sometimes faceted, flat on the other, and composed of a dense fine altered siliceous rock. In one instance the angular ridge is replaced by a long central facet, but in the other four the angularity is strongly marked, whilst considerable difference also exists in the proportions of the knives. One is very short and rather thick, one

* "Among Cannibals," 1890, p. 48.

and one-eighth inches in breadth by two inches long, but the two largest are respectively one and five-eighths, and one and two-eighths in breadth by three and four-eighths, and three and one-eighth in length. A fourth is more lanceolate, one and one-eighth inches broad, by three and two-eighths in length. The fifth knife departs from the general type of the others to some extent in that it is more truly scalpriform, thicker along the back than at the cutting edge, and the surface gradually sloping off from the former to the latter without being angular.

The whole of the knives are mounted in black gum, in four instances coated with red pigment. In three instances the gum hafting is gradually rounded off at the base to an obtuse point, and clearly was never continued by a wooden handle. In the fourth the mounting is broken short off against the posterior margin of the knife, but the fifth possesses a wooden extension to the gum base as previously described. In three instances the gum mounting or hafting bears small quadrangular impressions, on one or both sides, as if it had been bound with coarse canvas. The entire length of the most complete knife is about eight and one-eighth inches, made up as follows—blade three and four-eighths inches; gum mounting two and seven-eighths inches; and wooden handle one and seven eighths approximately.

The bark sheaths all appear to be made of the inner layers of the stringy-bark, two pieces laid together as described by Lumholtz in each case, and bound loosely with string. In three cases the string is of native manufacture, composed of a kind of flax, but in the fourth some manufactured string has been used with it. Three of the sheaths are very roughly made, but the fourth and longest, six and a half inches, is very neatly put together, and tightly and regularly bound round with string, the interspaces between the successive coils being filled in with a white clay, or pigment. It is the apex of this sheath which bears the tuft of bird's feathers.

Whether or no these knives are restricted in their use to the Mika operation, or as Mr. E. M. Curr terms it the "terrible

operation,"* and Sir John Lubbock† the "incredible ceremonial," it is difficult to say, but I am inclined to think they may have been used for other purposes.

The note accompanying the specimens simply states that they are "instruments for splitting the urethra."

A very interesting figure is given by Sir John Lubbock of an "Australian Flake," † but I take it to be a knife, from the appearance of its base, which even in the drawing shows traces of the gum used to hold it, and closely corresponds with one of those now before me. A similar knife is figured by Mr. R. B. Smyth, from the Paroo, but in place of any wooden handle the base is wrapt round with opossum fur.§

iii.—*An abnormal form of Tomahawk from Port Stephens.*

(Plate XIII., figs. 11-12.)

I am again indebted to Mr. Crummer for this interesting weapon from Swan Bay, Port Stephens. Its abnormal form is at once apparent, indeed I have never seen an aboriginal stone weapon figured like it, but in a grave examined by T. W. Edgeworth David and myself, we found an implement of a somewhat similar nature, and like it formed of a hard sandy shale.

The general form of this weapon is that of an elongated parallelogram, the longer sides quite parallel, and one end ground to a small cutting edge on both faces. It is nine and a quarter inches long, two and a half inches wide, only three-eighths of an inch in thickness, and its weight is eight ounces. If its conjectured use as a tomahawk be correct, it was probably held directly in the hand, without the intervention of a handle, although it must be confessed there is no trace of hollows

* "The Australian Race," 1886, I. p. 74. In my former paper I omitted to mention that Mr. Curr has figured a rude example of one of these knives with its handle and sheath. (*Loc. cit.* pl. opp. p. 148.)

† "Pre-Historic Times," 4th edition, 1878, p. 460.

‡ "Pre-Historic Times," 4th edit., 1878, p. 92, f. 93.

§ "Aborigines of Victoria," 1878, I. p. 380, f. 201.

for affording a grasp of the weapon such as are seen on those axes known to have been used in this way. Or, it may have been used for skinning, and other similar purposes, as its obvious weakness would ill fit it for the heavy work to which the blacks put their tomahawks. The implement to which I above compared the present specimen, is but little thicker in its substance than the latter. It is much shorter, being five inches in length, but slightly wider, having a width of three inches. Instead of being ground to a cutting edge at one end, it is so along one of the longer sides. It clearly afforded a better grip to the hand than the Port Stephens weapon, and in all probability was used for skinning. It is composed of micaceous sandy shale. Of whatever use these implements may have been, there can be no doubt as to their wide deviation from the generality of stone axes met with in eastern New South Wales.

iv.—*A well-finished Tomahawk of ordinary form from Brisbane Water.*

In contradistinction to the foregoing "tomahawks" is the exceedingly well finished implement from near Gosford, Brisbane Water, and forwarded to me by the same careful collector, Mr. Crummer. It is of the ordinary wedge-shaped type, and is made from a pebble of a dense greenish-black, fragmental, altered and basic rock. As is usually the case with our aborigines, the shape of the pebble has been taken advantage of, and it has been ground down to a cutting edge on both sides for quite a third its length. The cutting edge describes a segment of a circle, the diameter of which would be at least seven inches, but it rather unequally rounded at one extremity. On the other hand it has been most carefully kept in the middle transverse line of the pebble. The bevelled faces show distinct evidence of several successively ground surfaces, the final one on both faces resulting in a perfectly clean sweep from top to bottom. The dimensions are as follows—length, four and three-quarter inches; greatest breadth, two and six-eighths; thickness, one and six-eighths inch.

and weight, one pound two ounces. The sides of the pebbles are flattened, but unground, retaining the natural polish of the stone. Altogether this axe forms a very compact weapon.

EXPLANATION OF PLATES.

Fig. 8.—Mika-Knife with wooden handle; North Central Queensland. Australian Mus. Somewhat reduced.

Fig. 9.—Edge view of same.

Fig. 10.—Ornamented bark sheath of another example, the interstices between the string filled with pigment; ditto.

Fig. 11.—Abnormal Stone Tomahawk made of a hardened shale, bevelled at one end; Port Stephens. Mining and Geol. Mus.

Fig. 12.—Another abnormal form from a grave at Long Bay, near Botany, ground along one of the longer edges. Mining and Geol. Mus.

NOTES AND EXHIBITS.

Dr. Cox exhibited an albino specimen of *Dacelo gigas*, obtained by Mr. Caley; also a very fine example of the base of the stolon of a fossil plant (*Equisetum*) from a road-cutting in the Hawkesbury Sandstone at North Shore. He also made some remarks on a plague of mice of at present undetermined species recently infesting his premises at North Shore; they first attracted attention in the garden by their depredations on the flowers of *Hibiscus*; then in the house, where they exhibited great partiality for fruit, but avoided such articles as cheese; ultimately becoming a nuisance through their nesting in drawers and destroying papers for the purpose of making their nests.

Mr. Maiden exhibited some of the specimens referred to in his paper, viz., fruits of *Drimys aromatica* and *dipetala*; yellow powder on the fruits of *Lomatia ilicifolia*; essential oil of *Eucalyptus maculata* var. *citriodora*, the citron-scented gum of

Mr. Fletcher exhibited a collection of 60 species of plants obtained at King George's Sound by the Rev. R. Collie, F.L.S., and presented by him to the Society. They were obtained during a three hours' stay at the Sound ; and, being just such a collection of West Australian plants as travellers by the mail steamers have the opportunity of collecting under similar circumstances, a list of them is appended, Dr. Woolls having kindly determined them :—

DILLENIACEÆ, *Hibbertia grossulariaefolia*, Salisb. ; *H. Cunninghamii*, Hook. ; *H. amplexicaulis*, Steud. : PITTOSPORÆ, *Sollya heterophylla*, Lindl. : TREMANDRÆ, *Tremandra stelligera*, R.Br. ; *Tetraloea affinis*, Endl. : POLYGALEÆ, *Comesperma virgatum*, Labill. : GERANIACEÆ, *Pelargonium australe*, Willd. : RUTACEÆ, *Boronia crenulata*, Sm. ; *B. spathulata*, Lindl. ; STACKHOUSIÆ, *Stackhousia pubescens*, A. Rich. : LEGUMINOSÆ, *Gompholobium tomentosum*, Labill. ; *Burtonia conferta*, DC. ; *Hovea elliptica*, DC. ; *H. trisperma*, Benth. ; *Pultenaea obcordata*, Benth. ; *Psoralea pinnata*, Willd. ; *Kennedyia rubicunda*, Vent. ; *Acacia pentadenia*, Lindl. : MYRTACEÆ, *Darwinia vestita*, Benth. ; *Verticordia Fontanesii*, DC. ; *Agonis flexuosa*, Schau. ; *A. theæformis*, Schau. ; *Melaleuca thymoides*, Labill. : UMBELLIFERÆ, *Xanthosia rotundifolia*, DC. : COMPOSITÆ, * *Cryptostemma calendulaceum*, R.Br. ; STYLIDÆ, *Stylidium carnosum*, Benth. ; *S. spathulatum*, R.Br. ; *S. fasciculatum*, R.Br. : GOODENOVIEÆ, *Scævola striata*, R.Br. ; *Diaspasis filifolia*, R.Br. ; *Dampiera alata*, Lindl. ; *D. leptoclada*, Benth. : EPACRIDÆ, *Astroloma pallidum*, R.Br. ; *Leucopogon alternifolius*, R.Br. ; *L. revolutus*, R.Br. ; *Lysinema conspicuum*, R.Br. ; *Andersonia sprengelioides*, R.Br. ; *A. micrantha*, R.Br. ; *Dracophyllum capitatum*, R.Br. : SCROPHULARINÆ, *Anthocercis viscosa*, R.Br. : PROTEACEÆ, *Isopogon cuneatus*, R.Br. ; *I. Baxteri*, R.Br. ; *Synaphea dilatata*, R.Br. ; *Grevillea pulchella*, Meissn. : THYMELEÆ, *Pimelea brachyphylla*, Benth. ; *P. nervosa*, Meissn. ; *P. imbricata*, R.Br. : SANTALACEÆ, *Leptomeria squarrosa*, R.Br. : ORCHIDÆ, *Thelymitra fuscolutea*, R.Br. ; *Diuris setacea*, R.Br. : AMARYLLIDÆ, *Conostylis setigera*, R.Br. : LILIACEÆ, *Agrostocrinum stypandroides*, F.v.M. ; *Johnsonia lupulina*,

R.Br. ; *Borya nitida*, Labill. ; *Hodgsoniola junciformis*, F.v.M. : JUNCACEÆ, *Dasypogon bromeliifolius*, R.Br. : RESTIACEÆ, *Anarthria prolifera*, R.Br. : CYPERACEÆ, *Lepidosperma gladiatum*, Labill. : GRAMINEÆ, * *Briza maxima*.

On the motion of Mr. Maiden, a cordial vote of thanks was accorded to Mr. Collie for his interesting donation.

Mr. Palmer showed portions of the roots of an apple tree infested with American Blight (*Schizoneura lanigera*). The plant was supplied from a nursery as a blight-proof variety but had failed to maintain its reputation.

Mr. Froggatt exhibited some orange leaves taken from a tree in the "Pomona" orchard, Thornleigh, covered with Fumagine (black mildew), a fungoid growth vegetating in the honey-dew secreted by a coccid. Also specimens of the "plague locust" from Hay, Mulwala, N.S.W., and the Wimmera, Victoria; and he called attention to the doubtful identification of this locust. In the Victorian Agricultural Report for 1873, a description and figures of this

WEDNESDAY, 25TH JUNE, 1890.

The President, Professor Stephens, M.A., F.G.S., in the Chair.

Mr. Arthur Richardson, Portrush, Ireland, was present as a visitor.

The President announced that Mr. Charles Hedley, F.L.S., Queensland Museum, had been elected a Corresponding Member of the Society.

DONATIONS.

"Mittheilungen der Naturforschenden Gesellschaft in Bern aus dem Jahre 1888." *From the Society.*

"Verhandlungen der Gesellschaft für Erdkunde zu Berlin." Band XVII., No. 2 (1890). *From the Society.*

"Annual Report of the Department of Mines, New South Wales, for the year 1889." *From the Minister for Mines.*

A Pamphlet entitled "Différentes formes des grêlons observés au sud-ouest de la Russie." Notice du Professeur A. Klossovsky. *From the Author.*

"Bulletin of the American Geographical Society." Vols. XXI., Supplement (1889); XXII., No. 1 (1890). *From the Society.*

"Tijdschrift voor Entomologie, uitgegeven voor de Nederlandsche Entomologische Vereeniging." Deel XXIX., Parts 3 and 4; XXX.; XXXII. (1885-89). *From the Society.*

"The Twenty-Sixth Annual Report of the Zoological and Acclimatisation Society of Victoria for the year 1889." *From the Society.*

"Natuurkundig Tijdschrift voor Nederlandsch-Indië, uitgegeven voor de Konink. Natuurk. Vereeniging in N.-I." Deel XLIX., (1889). *From the Society.*

"The Australasian Journal of Pharmacy." Vol. V., No. 53 (May, 1890). *From the Editor.*

"Abstracts of Proceedings of the Royal Society of Tasmania," April 22nd, and May 20th, 1890. *From the Society.*

"Report from Trustees of the Sydney Free Public Library for 1889-90." *From the Trustees.*

"The Journal of Comparative Medicine and Veterinary Archives." Vol. XI., No. 4 (April, 1890). *From the Editor.*

"Report of the Central Park Menagerie, New York, for the year 1889." *From the Director.*

"Bulletin de la Société Zoologique de France pour l'Année 1890." Tome XV., Nos. 2 and 3 (Feb. and March). *From the Society.*

"The Perak Government Gazette." Vol. III., Nos. 12-16 (April and May, 1890). *From the Government Secretary.*

"Journal of the Royal Microscopical Society, London, 1890." Part 2. *From the Society.*

"Bulletin of the Essex Institute, Salem." Vols. XX. and XXI., Nos. 1-6 (1888-89); "Charter and By-laws;" "Catalogue of the Chinese Imperial Maritime Customs Collection at the United States International Exhibition, Philadelphia, 1876." *From the Institute.*

"United States Geological Survey.—Monographs." Vols. XIII. (with Atlas), and XIV. (1888); "Bulletin." Nos. 48-53 (1888-89). *From the Director.*

"United States Department of Agriculture; Division of Ornithology and Mammalogy.—North American Fauna." Nos. 1 and 2 (1889); "Bulletin," I. (1889). *From the Secretary.*

"The Journal of the Cincinnati Society of Natural History." Vols. V., Nos. 2-4; XII., Nos. 2 and 3 (1882-89). *From the Society.*

"Proceedings of the American Academy of Arts and Sciences." n.s. Vol. XV., Part 2 (1888). *From the Academy.*

"Acta Societatis Scientiarum Fennicæ." T. XVI. (1888); "Öfversigt af Finska Vetenskaps-Societeten's Förhandlingar." T. XXX. (1887-88). *From the Society of Sciences of Finland.*

Mémoires de l'Académie Impériale des Sciences de St. Pétersbourg." VII.^e Série. Tome XXXVI., No. 17; XXXVII., No. 1 (1889). *From the Academy.*

"Agricultural Bureau of South Australia.—Proceedings at the First Congress held at Adelaide, March, 1890." *From the Secretary.*

"The Journal of Conchology." Vol. VI., Nos. 5 and 6 (1890). *From the Conchological Society of Great Britain and Ireland.*

"Videnskabelige Meddelelser fra den Naturhistoriske Forening i Kjöbenhavn for Aaret 1889." *From the Society.*

"Report of the Commissioners of Fisheries for N.S.W. on the Fisheries of the Colony for the year 1889." *From the Commissioners.*

NOTES ON THE HABITS AND EARLIER STAGES OF
CRYPTOPHASA UNIPUNCTATA, DON.

BY HENRY EDWARDS.

(Communicated by A. Sidney Olliff.)

One of the most singular instances of the change of habits in a species of Lepidoptera that has come under my notice is to be found in that of the insect referred to in the present article. As far back as 1858, I was fully acquainted with the species, and raised a considerable number to the imago state. It was then only to be found on the black wattle, *Acacia decurrens*, the larva burrowing into the stems and younger branches, but, as far as my observations went, never attacking the trunk or the larger arms of the tree. It was not unusual to find specimens in the very early morning, (i.e., at 5 or 6 a.m.) at rest upon the leaves of the wattle, but later in the day they hid themselves from the sunlight, and were very rarely met with. On my return to the colonies, during the past summer, I was led to observe that many fruit trees in the garden of the Hon. George Coppin, at Richmond, near Melbourne, had been attacked by some pest, and were rapidly approaching destruction. Close investigation displayed the fact that some burrows had been made in the trees, somewhat similar to those of the *Cossidæ*, the entrance to these burrows being artfully concealed by a small cap of fragments of wood and bark, so closely cemented together as to appear like a portion of the bark itself. Upon cutting down one of the diseased branches, and splitting it open, I found that the burrow passed almost at right angles to the very heart of the branch, and thence downward for a space of 15 or 16 inches. At the bottom of this burrow I found a full-grown larva, which, when disturbed, wriggled itself about with very rapid movements, crawling up and down its burrow with surprising quickness. Below the home of the first insect noted was another burrow of 12 inches in depth, and in this

I found a healthy pupa, equally with the larva disinclined to leave its resting place. Wherever throughout the garden a dead branch was to be seen, it was always found to contain one or more of these insects in either the larva or pupa state, and their number can be guessed at when I say that not less than thirty trees had been more or less attacked by this destructive species. Those most affected were cherry, plum, apricot, nectarine, and peach, but I found also one pear and one quince tree each containing a larva, and it is possible that in the course of a short time, the apple trees may also suffer. As in the *Cossidæ*, *Ægeriadæ*, and other internal feeders, the pupa, when near the final change, works its way to the mouth of the burrow, and the moth, as it emerges, softens the cover of chips with which the entrance is closed, and so makes its escape. The pupa does not protrude, as is the case in the above-named families, but remains a little distance within the opening. The moths emerge from the pupa about 6 or 7 p.m., and may then be found adhering to the branches, often *in copula*. They are easily attracted by light, and no less than eighteen fine specimens were taken in one evening at a lamp placed rather high in the house. They are exceedingly delicate insects, and are easily killed in the cyanide bottle, usually dying in from 20 to 25 seconds. Great care has to be exercised in handling them, as the fine silvery-white scales are very readily removed. The genus appears to be distinctly *Tortricid*, and has nothing in common (save its method of burrowing) with the *Cossidæ*, in which it has been placed by some authors.

The following descriptions apply to the stages in which I was enabled to observe it :—

Larva.—Full grown. Tortricid in form, the head tapering in front, and truncate, pitchy, rugose, with slight dorsal channel. Mouth parts ample. Upper side of body, except the 2nd segment, which is pitchy, dull pale chocolate-brown. Under side sordid white. Spiracles pale pitchy, as are also the thoracic feet. On the dorsum is a series of double ovate shining spots, placed transversely, a little darker than the ground colour. These spots differ

in intensity in various individuals. There are a few short hairs upon all the segments, and especially about the head and anal extremity. Length 35 mm.

Pupa.—Cylindrical, rounded in front, and tapering suddenly posteriorly. Colour bright chestnut-brown in life, changing to pitchy. The head, thorax, and wing cases darker than the rest. Surface very much roughened, the head and thorax being covered with transversely raised waved ridges. The abdominal segments are also wrinkled, but less rugosely. Wing cases broad, smooth, glossy, those of the antennæ being strongly defined. Anal segment rounded. Cremaster short, bifurcate. Length 23 mm. Width across wing cases 8 mm.

This pretty species must now be included among the most injurious insects of Australia, but as it is eagerly sought by collectors, its numbers may be easily kept in check. I have seen it in two collections marked *Morgia gigantella*, Walk.

ON SPECIES-MAKING.

By W. H. MISKIN, F.E.S.

NOTES ON AUSTRALIAN COLEOPTERA, WITH
DESCRIPTIONS OF NEW SPECIES.

By THE REV. T. BLACKBURN, B.A., CORR. MEM. LINN. SOC., N.S.W.

PART VII.

In the present memoir I offer to the Linnean Society descriptions of a number of new species that have been sent to me for identification by various correspondents, together (in some instances) with allied forms in my own collection which it seems desirable to deal with at the same time. In dealing with the smaller *Curculionidæ* there is, I fear, some inevitable risk of occasionally clashing with the work already done by Mr. Pascoe in England. Foreseeing this I sent home to that gentleman some considerable time ago a collection of specimens,—after having procured his consent,—with the request that he would look at them and return a number of examples that I specified with any information that he could supply. In due course these examples came back to me, but unfortunately with the information that only two of them were known to Mr. Pascoe, and without any suggestions such as I had hoped for as to the relation of the remainder to the genera that Mr. Pascoe had characterised. I have thus been thrown upon the study of Mr. Pascoe's memoirs as the only source of information, and if an occasional error (apportioning species to genera in which a comparison with types would show they cannot stand) should creep into my work, I am obliged to say, "there is no help for it." However, if I have erred it is on the side of caution, for where a species possesses the characters assigned by Mr. Pascoe to any genus I have placed it therein (stating the reasons for any doubt I may have in doing so) instead of making a new genus, in all cases where there is

the smallest room for doubt. By this means I have brought together in some genera (e.g. *Misophrice*) forms that a comparison with Mr. Pascoe's types would probably have led to my regarding as types of new genera; but I think it will be found that in all such cases I have stated sufficiently clearly the characters common to the species included under the name to prevent any confusion arising. I hope to offer the Society descriptions of other *Erirhinidae*, &c., continuing the present memoir, at an early date.

CARABIDÆ.

XANTHOPHÆA LOWERI, sp. nov.

Elongata; minus parallela; glabra; testacea; elytrorum sutura (basi excepta) vittaque laterali piceis; prothorace quam longiori haud latiori; elytris punctulato-striatis, interstitio tertio 3 vel 4 punctato.

[Long. $4\frac{1}{2}$, lat. $1\frac{1}{2}$ lines.

The presence of at least 3 setiferous punctures on each elytron will distinguish this species from all hitherto described resembling it in style of markings except *X. grandis*, Chaud., which *inter alia* is much larger, and has the prothorax much wider in proportion. The prothorax is scarcely different from that of *X. infuscata*, Chaud., but is scarcely so wide at its widest part. Apart from colour differences, its less parallel form and elytra much wider in proportion to the prothorax, together with its longer antennæ, will distinguish it from *X. infuscata*. In general form and marking it resembles *X. vittata*, Dej., but differs from that species in its longer antennæ, much narrower prothorax, which has no dark stripes (in the example before me), elytral interstices scarcely so flat and not quite so distinctly and closely punctulate, the third having 4 setiferous punctures (on one side one of them is wanting, but I think the pin on which the specimen is set passes through it), sutural dark stripe not reaching the base (in the example before me).

S. Australia, Yorketown; sent to me by Mr. O. Lower, of Parkside.

HYDROPHILIDÆ.

HYDROBATICUS CLYPEATUS, sp.nov.

Ovalis ; minus convexus ; vix nitidus (clypeo excepto) ; piceo-brunneus, hic illic rufescens et nigro-umbratus ; crebre sat fortiter duplo-punctatus, clypeo nitido sparsissime subtilissime punctulato excepto ; prothorace antice quam postice sat evidenter angustiori ; elytris striato-punctulatis.

[Long. 3, lat. $1\frac{2}{3}$ lines.

In all probability this species varies in markings and colour as much as *H. australis*, Blackb., does. It scarcely differs from that species except in being larger, with the striation of the elytra considerably more marked, and especially in the clypeus being (not as in *australis* punctured uniformly with the rest of the head but) thinly and very finely punctured in conspicuous contrast to the rest of the head, which is almost coarsely punctulate. I presume that this character will also separate it from *H. tristis*, MacL., and *luridus*, MacL., as both those species are said to be "coarsely punctured" without any part being excepted.

N. Territory of S. Australia ; taken at Burrundie by Mr. A. D. Hedbloom.

LAMELLICORNES.

NOVAPUS RUGOSICOLLIS, sp.nov.

Mas. Minus latus ; sat nitidus ; subtus sat dense rufo-hirsutus ; piceus, capite cornu brevi (quam antennarum clava sat breviori) erecto ad apicem simplici instructo ; prothorace quam longiori tertia parte latiori, antice paullo retuso, mox pone marginem excavatione parva impresso, crasse fortiter rugulose æqualiter punctulato, lateribus sat fortiter rotundatis, basi quam margo anticus duplo latiori, angulis anticis parum prominulis, posticis sat rotundatis ; elytris modice punctulato-striatis, striis obliquis geminatis, interstitiis duplo-punctulatis.

[Long. 10, lat. $5\frac{1}{2}$ lines.

This species is very distinct from any other of the genus that I have seen but probably comes near *simplex*, Shp., (from Western Australia) which I have not seen. It differs structurally from the other species that I have dissected in having the maxillæ denticulated only very obscurely within, and furnished with a long pencil of hairs at the apex, but in the absence of any other structural character I do not think this necessitates a new generic name. The middle of the front margin of the clypeus is turned up in the form of a small tooth, and there is a similar tooth at the lateral angle on either side of the clypeus in front of the eyes. The disc of the prothorax is obscurely flattened over a space somewhat similar in shape and extent to that occupied by the excavation in *N. Adelaide*, &c., but this is hardly noticeable unless an example be placed side by side with an example of one of the species having a large excavation; in this species the real excavation is very small and feeble,—decidedly more so than in any male *Isodon* known to me. The sculpture of the elytra is very similar to that of *N. Adelaide*, Blackb., but is a little stronger;—there are six striae running obliquely in pairs. the whole surface bears

CRYPTODUS DEBILIS, sp. nov.

Oblongo-ovatus; minus depressus; fuscus, antennarum clava testacea; sat nitidus; mento pilis perlongis ferrugineis sparsim vestito, basi depressa truncata; capite haud tuberculato, antice æqualiter sat fortiter rotundato, margine libero fortiter reflexo, crasse fortiter sat crebre (clypeo, reticulato-rugato magis quam punctulato, excepto) punctulato, antennis 9-articulatis, articulo 1° (2^{um} vix supereminenti) parum dilatato; prothorace quam longiori circiter tertia parte latiori, antice sat fortiter angustato, fortiter minus crebre punctulato, postice longitudinaliter late leviter sulcato, lateribus sat fortiter arcuatis, angulis anticis acutis parum productis, posticis rotundatis, basi media late sat fortiter lobata utrinque sat manifeste impressa; scutello crasse leviter punctulato; elytris lineato-punctulatis, puncturis ocellatis a sutura ad marginem lateralem gradatim obsolescentibus, interstitiis nonnullis subelevatis; pygidio sat crebre ocellato-punctulato; tibiis anticis extus fortiter acute 3-dentatis. [Long. 6, lat. 3½ lines.

The mentum is declivous immediately in front of its base which is truncate (its shape thus being the reverse of what is usual in the genus); this character,—and the antennæ of 9 joints, of which the 1st is very much less dilated than in *C. piceus*, *caviceps*, &c., and is produced on its upper side scarcely beyond the apex of the 2nd joint,—will at once distinguish the present insect from all its previously described congeners.

N. Territory of S. Australia; taken by Mr. Hedbloom.

BUPRESTIDÆ.

CHALCOPHORA PEDIFERA, sp. nov.

Supra viridi-nigra, capite antice igneo-cupreo, prothorace ad latera et elytrorum spatiis depressis, (nonnullis basin versus et pone humeros maculatim positis, altero rotundato sat magno disci in medio posito, alteroque postice marginem lateralem versus pedi formam simulante) læte viridibus plus minus aureo-pubescentibus; corpore subtus læte viridi,

abdomine maculatum viridi-nigro, hic illic (præsertim antice) aureo-pubescenti; antennis obscuris; pedibus læte viridibus, tarsis supra cæruleis subtus testaceis; spatiis omnibus depressis (his læte viridibus) crebre subtilius granuloso-punctulatis, spatiis ceteris (his viridi-nigris) plus minus fortiter minus crebre punctulatis; capite inter oculos valde concavo; prothorace canaliculato, quam longiori dimidia parte latiori, mox ante basin quam ad basin paullo latiori, illinc ad marginem anticum leviter angustato, lateribus fere rectis, margine antico bisinuato, basi media leviter lobata, angulis posticis sat acutis; scutello parvo transverso longitudinaliter sulcato; elytris sat convexis (latitudine majori paullo pone medium posita), obscure 5-costatis (sutura costata inclusa), costis externis 3 interruptis, lateribus apicem versus fortiter denticulatis.

[Long. 10, lat. 3½ lines

The anterior depressed space on the elytra is feebly defined and may perhaps be best regarded as a single depression occupying somewhat narrowly the external $\frac{2}{3}$ of the base, running narrowly round the shoulder and a little down the lateral margin and then dilating somewhat behind the shoulder; it is however interrupted in several places by the elytral costæ and might be regarded as several distinct spaces. The discal depressed space is well defined and somewhat near circular; its area is not much less than that of the eye. The crook-shaped depression is placed immediately within the 5th costa,—its head curving inwards, cutting widely through the 4th costa close to its apex, and reaching to the 3rd costa; its length is rather more than $\frac{1}{2}$ the length of the whole elytron and it does not very nearly attain the apex of the elytra. The 3rd costa (counting from, and including, the suture) is interrupted in front of its middle by the discal depressed space, the 4th costa close to its apex by the crook-shaped depressed space and the 5th close to its base by the post-humeral dilatation of the basal depressed space. The underside is almost entirely occupied by colouring and sculpture similar to those of the depressed portions of the upper surface but there are some portions on the

ventral segments running for the most part irregularly down the middle line similar to the non-depressed parts of the upper surface. The antennæ are of obscure pitchy appearance ; the basal portion of each joint, however, to a decreasing extent from the basal joint, is reddish. The widest part of the prothorax is about $\frac{3}{4}$ the width of the widest part of the elytra.

N. Queensland ; Daintree R. district. In the collection of Mr. French, Victorian Colonial Entomologist.

ELATERIDÆ.

TETRALOBUS THORACICUS, sp.nov.

Parallelus ; testaceus ; capite prothoraceque piceo-nigris, crebre crasse valde rugulose punctulatis ; hoc quam latiori longiori nec canaliculato nec foveato, latitudine majori ad marginem anticum posita, angulis anticis productis lobatis ; prothoracis lateribus ab angulis anticis longe post medium leviter convergentibus, hinc divergentibus et utrinque in spinam acutam uncinatam retrorsum directam productis, pone spinam ad basin fortiter arcuatim convergentibus, basi fortiter emarginata ; elytris breviter sat dense pubescentibus, leviter seriatim punctulatis, puncturis subquadratis, interstitiis angustis leviter carinatis, et puncturis et costis apicem versus subobsoletis, sutura in spinam producta ; antennis læte testaceis vix prothoracis spinam attingentibus, longe flabellatis, flabellis quam inter oculos capitis latitudinem vix brevioribus.

[Long. $11\frac{1}{2}$, lat. 3 lines.

The very peculiar shape of the prothorax at once distinguishes this species from all its congeners yet described.

Western Australia ; Israelite Bay ; in the collection of Mr. French (Melbourne).

TENEBRIONIDÆ.

CHALCOPHERUS SUPERBUS, sp.nov.

Oblongus ; sat convexus ; sat nitidus ; niger, clypeo labroque (hoc apice aureo-ciliato) antice et palpis ad apicem testaceis, elytris cyaneo, purpureo, aureo et viridi læte alternatim vittatim ornatis ; oculis modice approximatis ; capite

crebre subtiliter, prothorace subtiliter minus crebre, punctulatis; hoc quam longiori (et postice quam antice) duplo latiori, lateribus (nisi in parte tertia antica) subparallelis, angulis anticis sat rotundatis, posticis rectis; elytris sat fortiter striatis, striis (apicem versus profundioribus) puncturis minoribus crebris instructis, interstitiis subconvexis fere ut prothorax punctulatis; abdomine crebre subtilius fere rugulose sat æqualiter punctulato, longitudinaliter vix manifesto rugato. [Long. $10\frac{1}{2}$, lat. $5\frac{1}{2}$ lines.

Probably resembles *Amarygmus grandis*, MacL., but appears to be still larger. I presume it cannot be identical with that insect, as the sculpture of the elytra of the latter is said to be "with regular rows of small punctures" and the interstices minutely and somewhat rugosely punctate." In both these respects the present insect differs, having punctulate-striate elytra, and interstitial puncturation not at all rugulose. Moreover, the "undersurface" of *A. grandis* is said to be "striolate," but in the present species the striolation on the undersurface (so well-defined in many of its congeners) is only feebly indicated. I

CHALCOPTEBUS INTERIORIS, sp.nov.

Oblongus; præcedenti valde affinis sed multo minor et differt labro clypeo palpisque concoloribus, capite paullo minus prothorace paullo plus crebre punctulatis; hoc postice quam antice parum plus dimidia parte latiori lateribus leviter sat æqualiter arcuatis, elytrorum interstitiis paullo plus crebre punctulatis, corpore subtus nitidiori, subtiliter sparsissime punctulato; prosterno (ad latera), metasterno, et latera versus segmentis ventralibus (his longitudinaliter), fortiter rugatis. [Long. $6\frac{3}{8}$, lat. $3\frac{2}{8}$ lines (vix).

The markings on the elytra of the single example before me of this species scarcely differ in any respect whatever from those of *C. superbus*, but the very different shape of the prothorax and very different sculpture of the undersurface show that the species are quite distinct *inter se*.

S. Australia, McDonnell Ranges; a single example in the collection of Mr. French (Victorian Colonial Entomologist).

PEDILIDÆ.

ANAPLOPUS, gen.nov..

Capitis vertex prothoraci contiguus; prothorax lateraliter haud marginatus; tarsorum articulus penultimus haud bilobus; unguiculi basin versus obtuse subobsolete dentati.

The above characters will I think distinguish this genus from all previously described. Although the proximity of the head to the prothorax (the neck being visible only from beneath) would place it in M. Lacordaire's arrangement near *Scraptia* and *Xylophilus*, it has much more the facies of *Egestria*. The mandibles are bifid at the apex. The palpi resemble those of *Egestria* except in the apical joint of the maxillary being securiform rather than cultriform. The labrum and clypeus resemble those of *Egestria* but are somewhat wider in front, the sides of the latter being more reflexed above the base of the antennæ, which together with the presence of some obscure tubercles on the head, gives

that segment an uneven appearance. The eyes are like those of *Egestria* but are a trifle more prominent and more coarsely granulated. The antennæ (set back) reach beyond the middle of the elytra; they are filiform, the basal 2 joints being short and of equal length, joint 3 nearly equal 1 + 2, 4 slightly shorter than 3, 5 evidently longer than 3, 6 a little stouter than the joints on either side of it and scarcely as long as 5, 7-11 becoming gradually a little longer and a little more slender, 11 being very little longer than 5. [It is not improbable that the antennæ are different in the other sex.] The prothorax is cordiform scarcely transverse, the base and apical margin being equal or nearly so in width; its sides are strongly convex in the front portion; its surface is strongly tuberculate, two rows (each of 3 or 4 elongate compressed tubercles) running down either side of the middle line and 2 or 3 smaller and somewhat spine-like tubercles projecting from the lateral margin on either side; these lateral tubercles are more or less connected by a cariniform line which give the appearance at a casual glance of the prothorax being laterally margined, but on

anterior coxæ (which are open behind) being less prominent. The intermediate coxæ are narrowly separated; the hind coxæ contiguous (as in *Egestria*). The femora and tibiæ are much like those of *Egestria* but the apical spines of the latter are feebler. The tarsi differ from those of *Egestria* chiefly in the basal joint of the hind pair being shorter, in the penultimate joint being entire, and in the dilated piece (near the base) of the claws being more defined, extending further along the claws and presenting on the inner margin a feebly subdentiform appearance. The entire upper and under surface is somewhat thinly clothed with longish golden-brown hairs. The general character of the sculpture is that of an *Amycterid*.

Notwithstanding the very remarkable sculpture of this insect it is, I think, clearly a *Pedilid*.

ANAPLOPUS TUBERCULATUS, sp. nov.

Elongato-oblongus; sat nitidus; sericeo-micans; brunneus, capillis brunneo-aureis minus crebre vestitus; capite prothorace elytris punctulatis sat fortiter tuberculatis; elytris in parte sub-reticulato-carinatis, carinis nonnullis eburneis.

[Long. $4\frac{1}{2}$, lat $1\frac{1}{2}$ lines.

Under the heading of the genus I have given a description of this species rendering further details unnecessary.

Richmond R., N. S. Wales; sent to me by Mr. T. G. Sloane.

CURCULIONIDÆ.

In the measurements of the species of this family I have included the rostrum.

DYSOSTINES.

I have before me several species of this genus, all taken in S. Australia. I do not think any of them capable of generic separation in spite of some structural differences; in this I should probably be supported by Mr. Pascoe (the author of the genus) who has recognized the presence and absence of a scutellum within its limits. They all possess the following characters,—mentum not entirely concealing the mouth organs, rostrum very stout and much

shorter than the prothorax, 3rd joint of tarsi dilated and bilobed antennal scape impinging on the prothorax, anterior coxæ not contiguous, metasternum very short, strongly marked sexual characters in the hind tibiae and basal ventral segment.

The eyes are fairly strongly granulate, the posterior corbels cavernous, the claws divergent. These important characters are omitted in Mr. Pascoe's diagnosis of the genus, but nevertheless I do not think I can be mistaken in its identification. I may add that in all the species I have examined the coxæ are wider apart in what I take to be the male than in the other sex.

DYSOSTINES CRAWFORDI, sp. nov.

Oblongus (1mas) vel breviter ovalis (1fem.); niger vel brunneus, antennis pedibusque (tarsis obscurioribus exceptis) brunneis vel brunneo-testaceis; supra squamis albidis brunneis nigrisque diversissime vestitus, et cum corpore subtus pedibusque pilis setiformibus (his in elytrorum interstitiis

I have had the opportunity of examining a long series of this insect which were said to have been taken all together feeding on growing cereals and to have been doing much damage. I have scarcely ever met with a more variable species. What I take to be the male is comparatively narrow (more than twice as long as wide), with the elytra (at their widest scarcely wider than the prothorax) considerably narrowed in front and having evidently prominent humeral angles, while the whole surface of the basal ventral segment is gently concave longitudinally. The other sex is much wider (quite half as wide as long), with the elytra not or scarcely narrowed anteriorly, evidently wider than the prothorax, and with less prominent shoulders, while the basal ventral segment bears a large more or less strongly defined triangular depression, the apex of which is a little in front of the middle of the segment. It would be useless to attempt a detailed description of the pattern formed by the scales on the prothorax or elytra as I have seen at least 20 varieties; some are unicolorous of a pale brown, some have blackish vittæ on a pale brown ground, some are almost entirely black, while some are variously mottled with black, brown and white.

Of the species of *Dysostines* previously described all except *pilipes*, Pasc., and *pustulosus*, Pasc., have either a carinate rostrum or the prothorax longitudinally channelled. The rostrum and prothorax of *pilipes* are insufficiently characterised, but its hind tibiæ are figured and described as very peculiar and quite different from those of the present species. It is not stated whether the prothorax of *pustulosus* has a dorsal channel, but in any case it differs widely from the present species in having the elytra studded with small raised spots.

S. Australia; Mannum, on the river Murray; sent to me by F. S. Crawford, Esq., the author of valuable memoirs on *Diptera*, &c.

DYSOSTINES VENTRALIS, sp. nov.

Oblongus; niger; antennis (scapo excepto) tarsisque ferrugineis; supra squamis nigro-piceis vestitus,—nonnullis brunneis (dispersis) et niveis (in maculas parvas congestis) inter-

mixtis,—setulisque brevibus pallidis raris ornatus; rostro quam latiori duplo longiori, supra 4- vel 5-carinato, arcuato; antennarum funiculi articulis 3-7 vix latitudine crescentibus, 1^o vix transverso: prothorace quam longiori quarta parte latiori, supra equali, antice leviter tubulato, vix manifeste punctulato, crasse confuse striato-ruguloso, lateribus leviter arcuatis; scutello distincto; elytris prothorace quinta parte latioribus, postice abrupte declivibus, striato-punctulatis, puncturis sat magnis, stria leviter impressis, interstitiis vix convexis, humeris haud prominulis; mesosterno simpliciter vix declivi; prosterno inter coxas anticas quam antennarum clava sat latiori; segmento ventrali 1^o medio planato glabro nitido in laminam super segmenti 2ⁱ basin fortiter producto; tibiis ad apicem intus fortiter curvatis, posticarum parte dimidia apicali intus dentibus 4 vel 5 armatis.

[Long. $3\frac{1}{8}$, lat. $1\frac{1}{8}$ lines.

The spots formed by white scales are,—5 or 6 on either side of the prothorax, of which 1 on either side near the front margin is conspicuous and apparently invariable,—1 on each shoulder,—a number varying from 1 to 10 scattered about the external half of each elytron, and generally a few along the suture on either side (where these are reduced in quantity it is usually in the front half that they are wanting). The prosternum between the anterior coxæ is wide enough to afford room and to spare to receive the club of one of the antennæ. There is a well defined transverse suture dividing the portion of the prosternum between the anterior coxæ.

I have seen six examples answering to the above description and varying only in the number of white spots and in one of them being a little smaller and paler in colour than the rest; a seventh specimen (which I regard as a variety) has its ground colour entirely pale brown, with the alternate interstices of the elytra a little more convex than the others and the process of the basal ventral segment unusually developed; two specimens (which I take to be the other sex,—probably female) have the upper surface considerably suffused with white scales,—which obscure the spots

more or less, are somewhat shorter and broader, have the basal ventral segment obscurely triangularly depressed behind with the hind margin scarcely lobed in the middle, and the tibiæ much less strongly bent at the apex and scarcely toothed.

The species of *Dysostines* previously described are all much smaller than this except *valgus*, Pasc., from Queensland, which has the prothorax "longitudinally sulcate" and the shoulders of the elytra "auriculate," &c.

S. Australia ; Port Lincoln ; Yorke's Peninsula ; near Adelaide. Occurs on plants growing on the sea-shore.

DYSOSTINES PILOSUS, sp. nov.

Oblongus (?mas) vel brevius ovalis (?fem.); piceus vel piceo-ferrugineus, antennis pedibusque plus minus brunneo-testaceis; supra squamis cinereis albisque (his hic illic maculatim vel vittatim condensatis) densissime vestitus, setulis brevibus pallidis intermixtis; ad latera pilis subtilibus elongatis instructus; corpore subtus et pedibus longe pilosis; rostro quam latiori minus duplo longiori, supra æquali arcuato minus planato, crebre subrugulose subtiliter punctulato; oculis subprominulis; antennarum funiculi articulis 3-7 vix latitudine crescentibus, 7° vix transverso; prothorace quam longiori nullo modo latiori, supra æquali, antice leviter tubulato, duplo-punctulato, lateribus sat fortiter rotundatis, scutello vix distincto; elytris prothorace vix (?maris) vel dimidia parte (?feminæ) latioribus, postice minus fortiter (?maris) vel fortiter (?feminæ) declivibus, striato-punctulatis, puncturis sat magnis, interstitiis vix convexis crebre subtiliter punctulatis, humeris haud prominulis; mesosterno simplici declivi; prosterno inter coxas anticæ quam antennarum clava multo angustiori; segmento ventrali 1° medio vix planato (?maris) vel obscure triangulariter depresso (?feminæ); tibiis posticis ad apicem intus fortissime arcuatis (?maris), vel extus leviter intus sat fortiter abrupte dilatatis (?feminæ).

[♂. Long. $3\frac{1}{2}$, lat. $1\frac{1}{8}$ lines; ♀. Long. $2\frac{4}{5}$, lat. $1\frac{1}{8}$ lines.

This species differs so much superficially (chiefly owing to the long soft hairs with which it is clothed on the sides and beneath) from the others known to me of the genus that I place it here with some hesitation, but I can find no structural character on which to separate it except in the evidently greater convexity of the eyes, but I do not think that sufficient. All the sculpture is hidden beneath densely packed scales except the punctulate striae of the elytra (the punctures in which, it should be noted, appear as in others of the genus—very much smaller than the removal of the scales shows them to be in reality). The ground-scales in all the examples I have seen are of an ashy or grey colour, but are sometimes obscurely tinged with a coppery lustre; the white scales form the following marks, none of which are particularly conspicuous, viz., a wide vitta on either side of the prothorax, a short vitta (sometimes much elongated) from the base of the 3rd, 6th, 7th, and 8th interstice on each elytron, and some spots about the sides and apex of the elytra (these spots wanting in many examples). The close fine puncturation of the prothorax seems to be that in which the scales are inserted—the same somewhat

DYSOSTINES PUNCTIVENTRIS, sp.nov.

Oblongus (fem. latior); piceus vel niger, antennis tibiis tarsisque plus minus ferrugineis; supra squamis fuscis cinereis albidisque dense obscure vestitus, setulis subtilibus erectis intermixtis; corpore subtus et pedibus sat longe pilosis; rostro quam latiori vix duplo longiori, supra leviter 5-carinato, arcuato, crebre subtilius aspere punctulato; oculis minus convexis; antennarum funiculi articulis 3-7 vix latitudine crescentibus, 7° leviter transverso; prothorace canaliculato, quam longiori circiter quarta parte latiori, antice leviter tubulato, crasse rugulose punctulato, lateribus leviter rotundatis; scutello minuto; elytris prothorace paullo (?maris) vel sat multo (?feminæ) latioribus, postice sat fortiter declivibus, striato-punctulatis, puncturis modicis, interstitiis vix convexis vix manifeste punctulatis, humeris haud prominulis; mesosterno simplici vix declivi; prosterno inter coxas anticas quam antennarum clava haud angustiori; segmento ventrali 1° medio concavo crebre aspere subfortiter punctulato (?maris) vel postice subtriangulariter depresso fortius minus crebre punctulato (?feminæ); tibiis posticis minus curvatis, apice extus et intus angulatim dilatatis, mox infra medium dente conspicuo (infra hunc nonnullis minoribus) armatis (?maris) vel sine dentibus (?feminæ).

[Long. maris $2\frac{4}{5}$, lat. $1\frac{1}{5}$ lines; long. feminæ $2\frac{2}{5}$, lat. 1 line.

The fine erect hair-like setæ clothing the upper surface of this species and falling into regular lines along the elytral interstices, though much shorter than those of *D. pilosus* and very differently disposed, yet seem to connect it with that species. Structurally, however, it is much nearer to *D. ventralis*. The pattern formed by the scales is variable; some examples are almost uniformly dark fuscous shading here and there into black; others are of an ashy fuscous tint with the prothorax laterally spotted or striped with dull whitish-grey, the latter colour extending itself to the shoulders of the elytra and forming some small spots scattered over the apical half of their surface. The sexual characters will

ensure ready identification; apart from these, however, *D. punctiventris* differs from *D. ventralis* by its pilosity and by the evidently greater separation of its intermediate coxæ.

S. Australia; Port Lincoln; on plants growing on the sea-shore.

N.B.—The species described above may be thus tabulated.

- A. The prothorax not longitudinally channelled.
- B. Funicle of antennæ with joints 3-7 scarcely increasing in thickness.
- C. Sides of the body clothed with long fine hairs..... *pilosus*.
- CC. Body not pilose *ventralis*.
- BB. Funicle with joints 3-7 gradually and considerably thickening..... *Crawfordi*.
- AA. The prothorax with a well-defined channel... *punctiventris*.

DESIANTHA.

I have little or no doubt as to the correctness of my identification of this genus, of which one of the species before me is evidently *D. silacea*, Pasc. Mr. Pascoe's genus *Brexius* is characterised in almost the same terms as *Desiantha* but is placed by its author among the *Amalactinæ* as having the corbels of the hind tibiae cavernous, and I cannot resist a doubt whether some of the species described below might possibly be called *Brexius* by Mr. Pascoe if they were before him. None of them have very decidedly cavernous corbels but in several (*e.g.*, *D. major*) although the tibiae terminate externally as in species with open corbels and their terminal fringe of cilia is directed hindward, it certainly appears as if the aperture in which the tarsus is inserted is partially closed when the aperture is looked into (*i.e.*, looking up the tibia). *D. maculata* shows something of this structure, but less distinctly than *D. major*. I do not think however that it would be at all possible to divide the following species into two groups on this character. Mr. Pascoe calls the antennal club in *Brexius* "adnata" and in *Desiantha* "distincta," but here again

I find variation within the limits of the species before me (*e.g.*, in *D. major* and *sericea* it is less distinct from the funicle than in *D. silacea* but certainly not closely united to it). I have an insect which seems to agree specifically with the description of *Brexius murinus*, Pasc., but I cannot think it distinct from *Desiantha*. The club of its antenna is less distinct than in *D. major* but its hind corbels are not more decidedly cavernous.

DESIANTHA NIGRA, sp.nov.

Oblonga ; nigra, antennis (clava excepta) tibiis tarsisque rufis ; squamulis griseis subtilibus setulisque ochraceis vestita ; rostro sat nitido minus elongato ; prothorace oblongo subtilius confertim nec rugulose punctulato ; elytris punctulato-striatis, puncturis sat quadratis, interstitiis convexis, singulo elytro apice in processu conico producto ; corpore subtus fortiter sat crebre punctulato. [Long. 4, lat. $1\frac{1}{2}$ lines.

In company with the specimens having the apex of the elytra produced I found several in which the apex was simply rounded, but apparently differing in no other way ; I take the difference to be sexual. This species must be near *D. caudata*, Pasc., (from Victoria), but apart from colour (which is quite uniform in all the specimens I have seen) it differs probably in the finer and smoother puncturation of the prothorax which furnishes a structural distinction from *D. silacea*, Pasc. ; whereas Mr. Pascoe describes the prothoracic puncturation of *caudata* and *silacea* in the same terms. It may be remarked that *D. nigra* seems to be very easily abraded as nearly all the examples I have seen are almost devoid of scales and have lost most of their erect setulæ. The rostrum is of the length of the prothorax.

S.A., occurs near Woodville, generally in flood refuse.

DESIANTHA MAJOR, sp.nov.

Elongato-oblonga ; nigra ; squamulis sat crassis setulisque erectis griseis vel fusco-griseis sat dense minus æqualiter vestita ; rostro sat nitido minus elongato ; prothorace oblongo minus subtiliter paullo rugulose punctulato ; elytris punctulato-

striatis, puncturis sat quadratis, interstitiis convexis, apicibus rotundatis; corpore subtus fortiter sat crebre punctulato.

[Long. $5\frac{1}{2}$, lat. $1\frac{1}{2}$ lines.

It seems difficult to find sharply defined characters to separate the species of this genus *inter se*,—indeed if the apical process of the elytra in *D. caudata* be not a reliable specific character there would seem to be little to distinguish that species from *D. silacea*. The present insect of which I have seen several examples (all quite identical) may be at once known by its large size, and I observe also a slight nodosity where the 5th and 6th elytral interstices unite at their apex which seems to be absent in the previously described species and in *D. nigra*. The black colour well clothed with somewhat coarse whitish-grey scales (which are more sparing in places and give a rather patchy appearance) seems characteristic. From *D. silacea*, Pasc., and *caudata*, Pasc., the colour of the derm differs entirely. From *D. nigra* the coarser and somewhat rugulose puncturation of the prothorax is a further distinguishing character. *D. nigra* is the only species known to me any examples of which have the elytra conspicuously produced at the apex. I think it hardly likely that that is the only one of which I have both sexes, so I suppose that if the character be sexual it is confined to certain species, but it is quite possible that there may be examples of the present species and of others that follow in which the elytra are not simply rounded.

S.A., near Adelaide; in flood refuse.

DESIANTHA SERICEA, sp. nov.

Oblonga; nigra, squamis sat magnis sericeis nigris et olivaceo-brunneis (his in prothorace longitudinaliter et latera versus, in elytris maculatim, dispositis) confertim æqualiter vestita; antennis (clava excepta) tibiis tarsisque rufescentibus; rostro sat nitido; prothorace oblongo subtilius confertim nec rugulose punctulato; elytris punctulato-striatis, puncturis sat quadratis, interstitiis vix convexis setulis pallidis erectis ornatis, interstitiis 5° 6°que postice conjunctis distincte nodulosis.

[Long. 4, lat. $1\frac{1}{2}$ lines.

The glossy shining scales closely adpressed and evenly covering the derm give this species a slightly metallic aspect. On the prothorax the paler scales are confined to the sides and a slender line down the middle, on the elytra they are conspicuously condensed on each shoulder and rather evenly scattered in small inconspicuous blotches over the rest of the surface. The present species comes nearest to *D. nigra* but (apart from colour and markings) is a little less narrowed behind with the elytral interstices scarcely at all convex, and bearing a very distinct (though by no means strong) nodosity* where the 5th and 6th interstices unite behind. The elytra are infinitely more closely scaled than in any specimen I have seen of either of the preceding species.

S.A., near Morgan on the river Murray; a single specimen resting on the trunk of a tree.

DESIANTHA MACULATA, sp.nov.

Oblonga; nigra, antennis (clava excepta) tibiis tarsisque rufescentibus; squamis albidis ochraceis et nigris dense maculatim vestita et spatiis parvis nudis sparsim variegata; rostro minus elongato, minus nitido; prothorace oblongo ad latera fortiter rotundato, læte albido-tri-vittato, confertim subtilius rugulose punctulato et granulato; elytris punctulato-striatis, puncturis sat magnis quadratis, interstitiis subcarinatis quibusdam elevatioribus, setulis suberectis ornatis, interstitiis 5° 6°que postice conjunctis leviter nodulosis.

[Long. 3, lat. $1\frac{1}{2}$ lines (vix).

On the forehead there is quite a tuft of pale hair-like scales; those placed transversely all down the surface of the rostrum (which is equal to the prothorax in length) are plentiful and conspicuous: the prothorax bears white scales in two or three sinuous rather conspicuous lines on the sides and in a very narrow straight line down the middle; on the elytra the ochreous scales are condensed along the suture, on the sides they are rather evenly mixed in among those of a whitish colour and they also somewhat obscurely

* This nodosity is very much less marked than in the insect mentioned above as agreeing specifically with the description of *Brexius murinus*, Pasc.

follow the lines of the interstices, while the blackish scales are condensed in somewhat square-looking spots (20 or thereabouts on each elytron), a very conspicuous one being placed immediately behind the slight nodosity in which the 5th and 6th interstices unite and terminate. The interstices are rather sharply elevated* especially towards the sides and apex and one or two of them (especially the 3rd and 6th) seem a little more prominent than the rest. Small denuded spots here and there show the somewhat nitid black derm; a row of semi-erect setæ runs along each interstice, the individual setæ being of the same colour as the scales among which they are inserted. The scutellum is whitish.

The above is the description of a well-marked brightly coloured example, but the species seems to be very variable, and in the numerous series before me (in which I can find no differences likely to be specific) the distinctness of the markings gradually diminishes till the opposite extreme from that I have described presents a nearly uniform clothing of whitish-brown or grey-brown scales. The most persistent markings (which are not quite

gulse punctulato, latitudine majori pone medium posita, disco medio carina brevi nitida ornato; elytris punctulato-striatis, puncturis sat quadratis, interstitiis (squamis rasis) sat convexis setulis raris vix conspicuis instructis, interstitiis 5° 6° que postice conjunctis sat fortiter nodulosis.

[Long. 3, lat. 1 line.

The squamosity is so even and dense as almost to conceal the sculpture. The general resemblance is to a feebly marked example of *D. maculata* from which the much less rugulose prothorax (which is at its widest distinctly behind the middle), the rostrum evidently more slender and elongate (it is longer than the prothorax), the short well defined nitid carina on the centre line of the prothorax and the manifestly stronger nodosity at the apex of the 5th and 6th elytral interstices will at once distinguish the present species. The carina on the prothorax furnishes a distinction from all the other species of *Desiantha* known to me.

Port Lincoln, S.A.

DESIANTHA OBSCURA, sp.nov.

Oblonga; nigra; antennis (clava excepta) tibiis tarsisque rufis; squamulis subtilibus setulisque pallidis suberectis vestita; rostro sat nitido minus elongato; prothorace oblongo minus subtiliter confertim sat rugulose punctulato; elytris punctulato-striatis, puncturis sat quadratis; interstitiis convexis, interstitiis 5° 6° que postice conjunctis vix nodulosis.

[Long. 4, lat. 1½ lines.

Extremely like the specimens of *D. nigra* with elytra not produced at the apex, but differs in the rugulose puncturation of its prothorax and in its elytra being at their widest immediately behind the base, whereas the elytra in *D. nigra* are narrower at the base and widen gently to about a third of their length. As in *D. nigra* the squamosity is very inconspicuous, so that the general appearance is much *black*er than in the other species of the genus. *D. obscura* differs from *D. nigra*, *silacea*, and (judging from the description) *caudata* in having a slight nodosity near the apex of the elytra; it is probably much like *Brexius lineatus*, Pasc., but

is much larger, with the prothorax not in the least granulate, the club of the antennæ quite distinct, the colour different, &c.

N.S. Wales ; sent to me by Mr. T. G. Sloane.

DESIANTHA PARVA, sp.nov.

Oblonga ; picea, squamis cinereis brunneis et cuprascentibus sat sericeis confertim sat aequaliter vestita ; pedibus (tarsis exceptis) rufescentibus ; prothorace oblongo minus subtiliter minus confertim vix rugulose punctulato ; elytris punctulato-striatis, interstitiis leviter convexis (nonnullis quam cetera elevationioribus) setulis (retrorsum curvatis) ornatis, interstitiis 4° 5° 6° que postice conjunctis manifeste nodulosis.

[Long. 2, lat. $\frac{3}{4}$ lineæ (vix).

The most noticeable character of this little species is the coppery tinge of some of its scales especially on the head and prothorax. The sculpture of the rostrum is very feeble, the longitudinal carinae being elevated only slightly. In the example before me it is probable that the prothorax is abraded, the disc being almost free

**E. Rostral sculpture very strong;
puncturation of prothorax
strongly asperate.....**

D. maculata.

EE. Rostral sculpture feeble; puncturation of prothorax not asperate (size 4 lines or thereabouts)

D. sericea.

EEE. Rostral sculpture almost wanting ; puncturation of prothorax slightly asperate (size 2 lines or thereabouts).....

D. parva.

DD. A short longitudinal carina on the disc of the prothorax.....

D. assimilis.

BB. Size large (5 lines or thereabouts).....

D. major.

AA. The derm testaceous or ochreous.....

{ *D. silacea*, Pasc.
 { *D. caudata*, Pasc.

ANORTHORHINUS, gen. nov.

Corpus oblongum squamosum setosumque; oculi sat depressi, fortiter granulati, ovales, infra nonnihil approximati; rostrum sat validum, arcuatum, supra longitudinaliter 5-carinatum, basi subito angustatum; scrobes subapicales infra rostrum proficiscentes oculos attingentes; scapus oculum vix attingens; funiculus 7-articulatus, articulo primo crassiore, ceteris sat brevibus, 6° 7° que invicem crassioribus; prothorax subcylindricus, antice in medio nonnihil productus, basi subtruncatus; scutellum distinctum; elytra oblonga prothorace multo latiora; pedes mediocres; femora in medio incrassata mutica; tibiæ flexuosæ, anticæ apice breviter mucronatæ; tarsorum articuli basales 3 sat breves, 3^{um} bilobus minus dilatatus, ultimus ceteris conjunctis vix brevior; unguiculi simplices divaricati; abdominis segmenta 3^{um} 4^{um} que conjuncta 2° vix breviora, sutura prima arcuata; coxæ anticæ haud

plane contiguae, intermediae sat distantes ; prosternum antice fortiter emarginatum.

The species for which I propose this name are very different in general appearance from most of the *Erirhinidae* and at first glance suggest the idea of a *Cryptorhynchid* which however is contradicted by the total absence of a prosternal channel. Some of the Australian genera seem almost to fill up the interval between the above-named groups.

This genus I should judge to be near Mr. Pascoe's *Phrenosmia* (although I should certainly not place it among the *Eugnomidae*), but from the description and figure of the latter it would appear that the rostrum is very differently shaped. In *Anorthorhinus* it is in shape and sculpture much like that of *Desiantha*, especially those species (e.g., *maculata*, Blackb.), where it is at its shortest,—but it differs in being conspicuously and abruptly constricted on either side (but not on its upper surface) immediately in front of the eyes. These latter are considerably less widely separated beneath than in *Desiantha*. The prothorax is very much

suberectis instructo; rostro prothorace vix breviori; hoc confertim granuloso punctulato; elytris minus fortiter punctulato-striatis, interstitiis planatis.

[Long. $2\frac{2}{3}$, lat. 1 line (vix).

The prothorax is about as long as wide, slightly narrower in front than at the base, with the sides fairly well rounded. The elytra at the base are nearly twice as wide as the base of the prothorax and are scarcely perceptibly narrowed hindward for two-thirds of their length, and then narrow more rapidly to the apex where they are conjointly rounded; their base is very slightly concave nearly all across but for a short distance on either side of its concave part it runs obliquely hindward to join the lateral margin, its junction with which is feebly angulate rather than rounded. The pale or obscurely golden scales on the surface are not at all conspicuous and are almost confined to the apical third part of the elytra where they form small obscure blotches. The white base and apex of the tibiæ are rather conspicuous in well-marked specimens.

I possess a second species of this genus but as I have only a single specimen somewhat abraded it seems better not to describe it.

S.A.; near Port Lincoln.

EMPLESIS.

I feel no doubt as to the correctness of my identification of this genus. One of the species before me is probably *E. scolopax*, Pasc. Besides the confirmation of generic identity furnished by the identification of a described *species*, I find further assurance in the superficial resemblance of the species before me to the European *Erirhinus nereis*, to which Mr. Pascoe compares them. The assistance of these clues is decidedly valuable, because the genus appears to have little structural consistency; thus Mr. Pascoe tells us that some species differ from others in respect of the form of the intermediate ventral segments, which would divide them between two of the principal sections of M. Lacordaire's

Erirhinides, and the species before me differ in a still more important character, some of them having a most unmistakable channel running down the front part of the prosternum,* which, according to M. Lacordaire, would take them out of the *Erirhinides* altogether. The fact is, I think, that a careful study of the Australian *Curculionides* goes far to obliterate the received distinction between the *Erirhinides* and *Cryptorhynchides*. There are several genera (*Enide*, *Lybæda*, &c.) which Mr. Pascoe at first regarded as aberrant *Erirhinides*, and then somewhat hesitatingly transferred to the *Cryptorhynchides* on account of their having a prosternal longitudinal channel in conjunction with contiguous anterior coxæ; and here we have a still greater difficulty of classification in the existence among species so close *inter se* that their *specific* distinction is no easy matter, both of a prosternum that cannot be called decidedly canaliculate at all and of one that is almost *strongly* canaliculate. In the species which I take to be *E. scolopax* there is practically no prosternal channel, but placed side by side with species having that character well-developed it shows indications of a similar structure in the deep emargination of the front of the prosternum and the presence of an obscure carina on either side running from the front of the coxæ to the point in the front margin of the prosternum where the emargination commences, the space intermediate between these carinæ being slightly depressed. It is perhaps a little puzzling that Mr. Pascoe has not referred to this character, and it may be that the insect I take to be *E. scolopax* is not really that species, but at the same time the indication of a prosternal channel is so slight that a describer not having before him any species of the genus in which it is more evident, might naturally enough pass it over without remark. I am not at all sure that the sex with the longer and more slender rostrum is the female, but as Mr. Pascoe seems to be clear on the point, I shall take it for granted that he is right. The eyes are coarsely granulated (Mr. Pascoe does not refer to their granulation). I may add that if these

* There is some indication of a similar structure in *Storcus*.

species were to be referred to the *Cryptorhynchides* on account of their prosternum anteriorly concave, the combination of contiguous anterior coxæ with the absence of a strong mucro at the apex of the anterior tibiæ would distinguish them from all known Australian genera.

EMPLESIS SCOLOPAX, Pasc.

This species appears to be distinguished from all others described by Mr. Pascoe or known to me by the well-defined fascicle of coarse scales on the forehead; these, however, are very easily rubbed off, and I possess only two examples in which they are very conspicuous. Mr. Pascoe seems to have known only one sex, as he characterises the rostrum as equalling in length half the body. This is no doubt the female; in my examples of this sex the rostrum is not quite equal to half the body when exactly measured, but it appears quite so to the eye. In specimens of the other sex (they were taken in company with those having the long rostrum and present no other difference) the rostrum is considerably shorter (being of the length of the anterior femur), and is stouter at the base, but narrower slightly at the apex, and the antennæ are inserted (not as in the female at the middle but) well in front of the middle of the rostrum. The 1st joint of the antennal funiculus is about half again as long as the 2nd, the 2nd about half again as long as the 3rd; the club is about as long as joints 5-7 together. In all the examples before me there is a conspicuous depression on the basal ventral segment.

EMPLESIS SIMPLEX, Pasc.

As all the examples of *Emplesis* before me are from S. Australia, this is the only one besides *scolopax* of those described by Mr. Pascoe which is likely to be among them. The description, however, of this species will not allow of my attributing any example to it. It appears to be smaller than *scolopax*, and to have the rostrum more arched and no fascicle of scales on the forehead; it would seem also that the scales with which it is clothed are all of uniform colour. Unfortunately Mr. Pascoe gives no information

as to the length of the rostrum or the position of the antennae, and does not state the sex of the specimen he described. I have no example in which the colour of the scales is quite uniform, and in all the species before me (except *scolopax*) the prosternum is quite distinctly concave longitudinally (a character which Mr. Pascoe would not, I think, have passed over), but I have more than one species of which either the male or female would fit Mr. Pascoe's brief description in other respects. I am afraid I must accept such risk as there is of giving a new name to this species.

EMPLESIS NOTATA, sp. nov.

Ferruginea, sat dense squamosa; squamis inter oculos quam cetera vix magis conspicuis; antennis minus gracilibus, funiculi articulo 1^o 2^o duplo (2^o 3^o haud multo) longiori; prothorace antice sat anguste rotundato-producto, apicem versus sat fortiter constricto, postice fusco-tri-vittato; elytris punctulato-striatis, singulis maculis vittiformibus plurimis fuscis ornatis, his fascias tres obliquas plus minus obscuras effiguntibus; prosterno antice longitudinaliter anguste

specimens not greatly abraded. In some examples some of the fuscous spots are wanting so that the fasciæ are more or less interrupted. There is a conspicuous depression on the basal ventral segment. The pattern on the elytra is perhaps somewhat similar to the "tesselation" which Mr. Pascoe briefly mentions on the elytra of *E. lineigera* from N. S. Wales;—that species however has the head "abruptly callous between the eyes." Compared with *E. scolopax* the rostrum in this species is shorter and stouter and the antennæ are less slender and are inserted nearer the apex, the 2nd joint of the antennal funiculus is shorter in comparison of the 1st and 3rd, the intermediate ventral sutures are decidedly drawn backward (though scarcely *angularly*) at their lateral extremities and the prosternum in front of the anterior coxæ is much more decidedly concave longitudinally.

S. Australia, near Adelaide. Specimens from Port Lincoln and Morgan seem identical though that from the latter locality is too much abraded for certainty.

EMPLESIS GRAVIS, sp. nov.

Obscure fusca, squamis griseis disperse minus dense vestita; antennis sat validis, funiculi articulo 1° 2° dimidia parte longiori, 3-7 brevibus, 3-5 modice (6 et 7 fortiter) transversis; prothorace antice sat anguste rotundato-producto, apicem versus subito fortiter constricto, lateribus pone constrictionem subrectis; elytris punctulato-striatis; prosterno antice longitudinaliter concavo. [Long. 2-2½, lat. ¾-¾ line.

Maris rostro minus valido, parum arcuato, prothorace paullo longiori, antennis paullo ante medium insertis.

Feminæ rostro sat gracili, fortiter arcuato, prothorace fere duplo longiori, antennis mox pone medium insertis.

A robust darkly coloured species with its paler scales evenly dispersed but not closely enough to hide the sculpture, especially on the prothorax where the close and moderately strong but not rugulose puncturation is quite conspicuous. The constriction near the front of the prothorax is much more abrupt than in the other

species I have seen. From *E. scolopax* this species may be at once distinguished *inter alia* by the strongly sulcate prosternum, absence of a fascicle of scales from the head, and much stouter antennae; from *E. notata* by the rostrum much longer in each sex as well as by the complete absence of pattern in the arrangement of scales. From *E. lineigera*, Pasc., and *simplex*, Pasc., its much superior size will immediately distinguish it. In *E. filirostris*, Pasc., the rostrum appears to be much longer still than in *E. gravis*, while *E. storeoides*, Pasc., has *inter alia* a mottled pattern on the elytra. In *E. gravis* the intermediate ventral sutures are distinctly angular at the sides; the scales clothing the surface are evidently finer and more seta-like than in the other species known to me.

Central Australia; McDonnell Ranges; taken by Mr. A. S. Wild.

EMPLESIS MUNDA, sp. nov.

Ferruginea; squamis griseis et ferrugineis vel fuscis vestita; antennis sat validis, funiculi articulo 1° 2° vix dimidia parte, hoc 3° haud multo, longiori, articulis 3-6 sat brevibus vix transversis, 7° leviter transverso; prothorace antice rotundato producto, apicem versus minus subito constricto, lateribus sat rotundatis; elytris punctulato-striatis, squamis ferrugineis maculatim dispositis; prosterno antice longitudinaliter concavo. [Long. 2, lat. $\frac{3}{4}$ line.

Maris rostro minus valido, minus arcuato, prothorace paullo longiori, antennis sat longe ante medium insertis.

Feminae rostro sat gracili, sat fortiter arcuato, prothorace sat longiori, antennis vix ante medium insertis.

In general appearance this species most resembles *E. scolopax* from which the structure of the rostrum (shorter in both sexes, in the female very much more strongly curved) stouter antennae of differently proportioned joints and quite strongly concave prosternum, &c., &c., will at once distinguish it. The markings on the prothorax resemble those of *E. notata* but seem more variable, the abbreviated vittae in some examples traversing the whole length of the segment while in others the middle one is absent;

the pattern on the elytra is almost exactly as in *E. notata* but the scales are not so closely set; from *E. notata* however the present species differs *inter alia* in its less robust build and especially in the antennæ being inserted in the male not much (and in the female scarcely) in front of the middle of the rostrum, while in ♂ *notata* their insertion is distant from the apex scarcely a quarter of the length of the rostrum and in the ♀ scarcely a third. The rostrum is not at all unlike that of *E. gravis* but scarcely so long, and in the female less strongly curved; from this species, however, the presence of a pattern on the upper surface and the much feebler constriction of the prothorax anteriorly, *inter alia*, will readily separate *E. munda*.

S. Australia; basin of Lake Eyre.

EMPLESIS ASSIMILIS, sp. nov.

Elongata; robusta; ferruginea, squamis cinereis confuse vestita; funiculi articulo 1^o quam 2^{us} duplo longiori, ceteris sat brevibus, ultimis vix transversis.

[Long. $2\frac{1}{8}$, lat. $\frac{4}{5}$ line (vix).

Maris rostro quam prothorax vix longiori leviter arcuato; antennis paullo ante rostri medium insertis.

Feminæ rostro quam prothorax sat longiori, sat fortiter arcuato; antennis vix ante rostri medium insertis.

This species is extremely close to *E. notata*, Blackb., but the sexual characters are very distinctive; apart from these I find little difference between the two species except that the mottled appearance on the elytra resulting from the mingling of ashy and dark ferruginous scales is more confused in *assimilis*,—so that the quasi-pattern which in *E. notata* is fairly well defined is here very obscure. The rostrum does not differ much in the males of the two species except in the insertion of the antennæ being a good deal nearer the apex in *E. notata*. The rostrum of *E. assimilis* is much longer in the female than in *E. notata* and is very much more strongly arched, with the insertion of the antennæ scarcely at all in front of the middle. Compared with *E. munda*, Blackb.,

the present species *inter alia* is of altogether stouter aspect, the rostrum of the female especially being more robust.

S. Australia ; near Adelaide.

EMPLESIS ALBOSIGNATA, sp. nov.

Elongata ; sat robusta ; ferruginea ; squamis ferrugineis fuscis et albis variegata, squamis albis mox pone suture medium fascia communi brevi condensatis ; funiculi articulo 1^o quam 2^o vix plus sesquilongiori, ceteris sat brevibus, ultimis vix transversis. [Long. 2, lat. $\frac{3}{2}$ line.

Maris rostro quam prothorax manifeste longiori, pro mare gracili, leviter arcuato ; antennis paullo ante rostri medium insertis.

Feminae rostro quam prothorax plus paullo longiori, gracili, sat arcuato ; antennis vix ante rostri medium insertis.

The general characters of this (as of the preceding) species are so like those of *E. notata* that it seems useless to repeat them in detail. The elytra however have markings which do not appear variable (I have seen four specimens). The dark fuscous scales are condensed into more or less numerous subquadrate spots, and besides these there are conspicuous white scales placed on and around the scutellum and also forming a short fascia crossing the suture immediately behind the middle (this fascia is continued *very indistinctly* quite to the lateral margins), and a few scarcely conspicuous spots near the apex. Compared with *E. notata* and *assimilis* this species has the antennal funicle more elongate, and the rostrum longer and more slender in both sexes (particularly in the male). The rostrum is more arcuate and the antennae are inserted further from the apex than in *E. notata*. I think the markings on the elytra may be relied on as a good character. There are some conspicuous snowy-white scales on the ventral segments also which do not appear in other species known to me.

S. Australia ; near Adelaide.

EMPLESIS UMBROSA, sp. nov.

Elongata ; sat robusta ; ferruginea ; squamis umbrinis et cinereis variegata ; squamis piceo-umbrinis in elytrorum

dorso ante medium conspicue condensatis, spatio obscura ita formata retrorsum triangulariter in medio producto et postea a squamis pallide cinereis valde distincto; funiculi sat robusti articulo 1° quam 2^{us} duplo longiori, ceteris brevibus, ultimis transversis; clava brevi lata.

[Long. $1\frac{3}{5}$, lat. $\frac{3}{5}$ line (vix).

!hujus speciei maris rostro quam prothorax manifeste longiori, gracili, leviter arcuato; antennis paullo ante rostri medium insertis. Feminae rostro quam prothorax manifeste longiori, gracili, leviter arcuato; antennis parum ante rostri medium insertis.

I am not quite sure of the specific identity of the two specimens before me, owing to their sexual differences being very slight as compared with those of other species of *Emplesis*, and yet sufficient to forbid their being regarded as both of one sex of the same species,—their rostra scarcely differing *inter se* except in the antennæ being inserted in one very little, and in the other much, in front of the middle. Their agreement in somewhat peculiar markings and in an unusually short robust antennal club, however, is strongly opposed to the idea of their representing two species. Their general characters are exceedingly close to those of *E. notata*, &c., but they are very differently marked. Regarding the ferruginous scales as forming the groundwork of the pattern, the dark scales are arranged on the prothorax much as in *E. notata*, but on the elytra they occupy nearly the whole of the anterior half, becoming more definedly dark hindward till the hind-edge of this darker portion is not far short of being black, and is triangularly produced hindward about the suture to somewhat behind the middle, where it is in strong contrast to the paler scales which are at their palest immediately behind it. There are also some dark patches variegating the apical portion.

S. Australia; near Adelaide.

The following tabulation will assist the identification of the described species of this genus.

A. Prosternum distinctly excavated longitudinally
in front of the anterior coxæ.

- B. Elytra variegated with a distinct tessellated pattern; prothorax in front moderately constricted.
- C. This pattern includes a conspicuous white mark crossing the suture about its middle... *albosignata*.
- CC. This pattern consists mainly of an irregular common dark blotch on the basal half..... *umbrosa*.
- CCC. This pattern consists of small ferruginous patches dispersed over an ashy ground.
- D. Rostrum distinctly arcuate in both sexes.
- E. Rostrum of male much shorter than of female..... *assimilis*.
- EE. Rostrum of male scarcely shorter than of female .. *munda*.
- DD. Rostrum almost straight in both sexes. *notata*.
- BB. Elytra devoid of pattern; prothorax in front strongly and suddenly constricted... *gravis*.
- AA. Prosternum not (or scarcely at all) concave

cylindric (or nearly so), but a little attenuated at the apex when viewed laterally, its sides striolate near the base; antennæ inserted a little in front of the middle of the rostrum, 2nd joint of funicle short; eyes moderately finely granulated; prosternum rather unusually elongate in front of the anterior coxæ, its anterior margin but little emarginate, mesosternum at least moderately wide; femora unarmed; anterior tibiæ mucronate at apex; claws divaricate, simple; basal ventral suture straight or nearly so; 3rd and 4th ventral segments together shorter than 2nd, their sutures angulated laterally; prothorax not bisinuate at base, its ocular lobes very feeble; intercoxal process of hind body wide, truncate or nearly so in front; general form wide and short as compared with many genera of *Erirhinidæ*.

CYDMÆA OBSCURA, sp. nov.

Ovata; picea, antennarum scapo rufescenti; squamis (supra brunneis albisque intermixtis, subtus albis solis) sat dense vestita; rostro prothoraci longitudine æquali; antennarum funiculi articulo 1° quam 2^{us} 3^{us} que conjuncti vix breviori, 2° 3° paullo longiori, ultimis 2 fortiter transversis, clava sat lata quam latiori vix duplo longiori; prothorace leviter transverso, antice angustato, lateribus leviter arcuatis; elytris striato-punctulatis, humeris paullo callosis; mesosterno quam *C. luctuosæ* (Pasc.) paullo angustiori.

[Long. $1\frac{2}{3}$, lat. $\frac{3}{8}$ line.

The lighter scales of the upper surface are extremely nitid and have a silky brownish gloss in some lights, while from other points of view they appear to be white; their arrangement is very confused; on the prothorax they are very evenly and closely sprinkled; on the elytra they are sprinkled chiefly about the base down the suture, and in the form of a very indistinct fascia behind the middle, the darkest colouring being immediately in front of this quasi-fascia. Differs from *C. bimaculata*, Pasc., by its antennæ, tibiæ, and tarsi not being of a ferruginous colour, its differently marked elytra, &c.

South Australia; near Port Lincoln.

N.B.—An example taken near Adelaide is somewhat larger (long. $1\frac{3}{8}$ line), has the scales on its elytra disposed without any distinct pattern (the paler scales however being somewhat condensed near the apex), and has the apical joints of its antennal funicle less transverse with the club more elongate, but does not differ otherwise. I hardly know whether to regard these characters as sexual or as marking a distinct species.

CYDMÆA DIVERSA, sp.nov.

Breviter elliptica; nigra; squamis pallidis (supra sparsim subtus sat confertim) vestita; rostro quam præcedentis paullo tenuiori, prothorace manifeste longiori; antennarum funiculi articulo 1° quam 2^{us} 3^{us} que conjuncti haud breviori, 2° 3° duplo longiori, ultimis vix transversis; prothorace leviter transverso, antice angustato, lateribus leviter arcuatis paullo pone marginem anticum leviter constrictis; elytris striato-punctulatis, humeris vix callosis; mesosterno quam *C. luctuosæ* (Pasc.) sat latiori; coxis anticis haud contiguas.

[Long. $1\frac{3}{8}$, lat. $\frac{3}{8}$ line.

As in *C. obscura* the whitish scales present, from some points of view, a nitid brown and silky appearance; they do not form a well-defined pattern; they are most conspicuous about the sides of the basal portion of the prothorax and are condensed in numerous small inconspicuous spots all over the elytra. The front coxæ not contiguous will separate this species from all others previously described in the genus.

W. Australia; taken by E. Meyrick, Esq.

CYDMÆA INVALIDA, sp.nov.

Elliptica; minus lata; nigra, antennis tibiisque rufescentibus; squamis pallidis (supra vix conspicue subtus sat confertim) vestita; rostro sat gracili, prothorace vix longiori; antennarum funiculi articulo 1° quam 2^{us} 3^{us} que conjuncti vix longiori, 2° 3° vix longiori, ultimis vix transversis; prothorace vix transverso, antice angustato, lateribus leviter arcuatis paullo pone marginem anticum vix constrictis; elytris

striato-punctulatis, humeris vix callosis ; mesosterno quam *C. luctuosæ* (Pasc.) vix latiori ; coxis anticis haud contiguas.

[Long. 1 (vix), lat. $\frac{2}{3}$ line (vix).

In the example before me (which may be a little abraded) the lighter coloured scales are scarcely indicated on the upper surface except on the sides of the prothorax, while they densely cover the undersurface. The mucro at the inner apex of the front tibiæ is feebler than in the other *Cydnaea* known to me, and the front margin of the prosternum is a little more decidedly emarginate. Though little different in form from its congeners, this species is a trifle narrower.

S. Australia, near Petersburg.

The following is a tabulation of the described species of *Cydnaea* :—

A. Front coxæ contiguous.

B. Colour of scales not metallic golden-green.

C. Tibiæ and tarsi (as well as antennæ)

reddish or testaceous..... *bimaculata*, Pasc.

CC. Colour black, with white scales, an-

tennæ ferruginous, legs obscure..... *pusilla*, Pasc.

CCC. Antennæ black (or with only the scape ferruginous).

D. Mesosternum wide ; upper surface with well defined snowy-white patches.....

luctuosa, Pasc.

DD. Mesosternum less wide ; upper surface devoid of sharply limited markings.....

obscura, Blackb.

BB. Colour of scales golden-green..... *viridula*, Pasc.

AA. Front coxæ distinctly separated.

B. Antennæ black, mesosternum very wide,

prosternum scarcely emarginate in front *diversa*, Blackb.

BB. Antennæ ferruginous, mesosternum less

wide, prosternum more distinctly

emarginate in front..... *invalida*, Blackb.

EMPOLIS, gen. nov.

Corpus angustum, elongatum; rostrum minus gracile, arcuatum, prothorace longius, supra longitudinaliter carinatum, apice ipso leviter dilatato; scrobes subapicales rectae fere infra rostrum positae infra haud conniventes; scapus oculum vix attingens; funiculus 7-articulatus, articulis 1° et 2° elongatis, ceteris brevibus, ultimis vix transversis; clava sat elongata; oculi magni, sat depressi, fortiter granulati; prothorax quam longior haud latior, antice quam postice paullo angustior, lobis ocularibus subobsoletis; scutellum distinctum; elytra prothorace paullo latiora; coxae intermediae valde approximatae; femora medio incrassata, mutica, basi pedunculata; tibiae anticae intus leviter bisinuatæ haud denticulatæ, apice curvatæ mucronatæ; tarsorum articulus ultimus sat elongatus; unguiculi divaricati, intus (basin versus) late obsolete dentati; abdominis segmenta 3^{um} et 4^{um} conjuncta 2° haud breviora; suturae ventrales ad latera haud angulata, 1^a arcuata; prosternum antice sat elongatum, fortiter emarginatum, haud canaliculatum.

The above characters in combination will distinguish this genus from all other *Erirhinid* genera yet described. I think it must stand near *Aoplocnemis*, from which its scrobes not meeting below the rostrum will at once distinguish it. *Enochroma* is insufficiently described being only distinguished from *Aoplocnemis* (and that by only four characters), but among those the scrobes distant from the eyes and the peculiar front tibiae are not found in the present insect. *Eniopea* has the antennal club equal to the apical 6 joints of the funicle (here scarcely equal to the last 4 joints) and no ocular lobes. *Desiantha* has the claw joint of the tarsi as long as the preceding 3 joints (here much shorter). *Anorthorhinus* has the rostrum suddenly contracted in front of the eyes. *Erirhinus* has divergent claws. *Agestra* has no ocular lobes. *Nemestra* has the front tibiae denticulate within. *Emplexis* has non-mucronate front tibiae. *Nedyleda*, *Paryzeta* and *Methone* have finely granulated eyes. *Empira* has the rostrum shorter than the prothorax and

the description implies that the 2nd ventral segment is longer than the following two. The feebly subdentate convexity of the basal part of the claws within is found in other *Erirhinidae* having the claws divaricate and is scarcely to be seen except under a compound microscope.

EMPOLIS ANGUSTATUS, sp. nov.

Elongatus ; subparallelus ; piceus, antennis (clava excepta) rufis, tibiis tarsisque subferrugineis ; squamis piliformibus ochraceis minus confertim vestitus ; antennarum funiculi articulo 2° 1° haud breviori ; elytris striato-punctatis, puncturis sat magnis subquadratis. [Long. $2\frac{1}{2}$ lines, lat. $\frac{3}{8}$ line.

The whole surface, including the rostrum and legs is thinly clothed with elongate pale scales which give the insect a slightly greyish appearance ; they do not form a defined pattern anywhere but on the prothorax fall into three scarcely indicated longitudinal vittæ. The prothorax is slightly constricted near the front, and the projection of the ocular lobes makes the front margin of that segment appear somewhat bisinuate when viewed from above. The eyes are not quite so distant beneath as in *Aoplocnemis*, &c., owing to which the scrobes (though almost on the undersurface of the rostrum) yet reach the eyes. The longitudinal carinæ of the rostrum are continuous almost to the apex but are not very strong and are much hidden by scales. The general appearance is quite that of a European *Erirhinus* (e.g., *E. nereis*).

S. Australia ; near Port Lincoln.

OLANÆA.

I have before me two examples (from Albany, the locality whence the type is reported) which present all the characters assigned in the latin diagnosis under this name as generic, and which I cannot bring myself to consider distinct from *O. nigricollis*, Pasc., in spite of some apparent specific discrepancies. In one of these examples there are some coarse scales as well as erect setæ on the upper surface,—the other having similar setæ but being almost absolutely scaleless,—the rostrum is clothed with

setæ (not only to beyond the middle but) to the end, and the basal joint of the antennal funicle is certainly not so much longer than the 2nd as "fere duplo." If Mr. Pascoe's measurement is inclusive of the rostrum these specimens moreover are larger than the size he mentions ($1\frac{1}{2}$ line) being quite $1\frac{3}{4}$ line, inclusive of the rostrum, but the rather peculiar arrangement of colours agrees so well with the description of *O. nigricollis*, and the generic characters are so identical that I hardly think the two can be different species.

The two above-mentioned specimens were sent to me folded up in a piece of paper in company with three other specimens which I cannot doubt ought to be considered as the same species; these latter however differ in having the whole of their upper surface densely clothed with coarse scales of silky appearance similar to those of the under surface (these scales on the upper surface are everywhere concolorous or nearly so with the derm, except that some whitish scales are condensed into three fairly distinct vittæ on the prothorax of which the lateral ones are

base of the prothorax is not bisinuate, the scrobes are directed beneath the rostrum and the scape of the antennæ (when set back) quite reaches the eye. If I am wrong in referring the species before me to *Olanæa* they will require a new generic name.

OLANÆA LETA, sp.nov.

Ovalis ; ferruginea, capite rostro antennis (scapo excepto) femoribus (apice excepto) tarsisque picescentibus ; rostro elytrisque albo-setosis ; prothorace trivittatim et elytris maculatim (ad humeros et circa scutellum) albo-squamosis ; rostro quam prothorax vix longiori apicem versus tenuiori nec angustato ; prothorace leviter transverso, apicem versus leviter angustato, sat crebre sat rugulose punctulato ; elytris punctulato-striatis, puncturis sat magnis, striis leviter impressis, interstitiis leviter convexis ; sutura inter segmenta ventralia 1^{um} et 2^{um} fere recta. [Long. $1\frac{1}{3}$, lat. $\frac{2}{3}$ line. (vix).

S.A. ; near Port Lincoln.

ANTYLLIS ALTERNATA, sp.nov.

Picea vel nigra, antennis pedibusque ferrugineis, unguiculis nigris ; squamis subtilissimis fuscis albidis et nigris variegata ; supra setis pallidis erectis (in rostro elongatis sat gracilibus, in partibus ceteris brevioribus crassioribus) ornata ; rostro arcuato sat valido, prothorace vix longiori, hoc cum capite leviter crasse subrugulose punctulato ; prothorace transverso antice angustato, fortius sat crasse sat rugulose punctulato, squamis albidis (in medio longitudinaliter condensatis) ornatis, margine antico sat elevato ; elytris punctulato striatis, interstitiis alternis sat fortiter convexis uniseriatim setosis.

[Long. $1\frac{1}{3}$, lat. $\frac{2}{3}$ line.

This species appears to be very like *A. setosa*, Pasc., but in that species the apical half of the rostrum is said to be rufo-ferruginous, and there is no mention of the alternate interstices of the elytra being costate. The scales are so minute as not to be individually distinct except under a compound microscope. In a perfectly fresh specimen they form three inconspicuous white lines

on the prothorax, the hind apices of which are conspicuous white spots at the base; on the elytra,—taking the pale fuscous scales as the ground colour,—the markings consist of white spots on the disc which a little behind the middle unite into a transverse fascia not nearly reaching the lateral margins, a white spot on each shoulder, and some obscure piceous blotches on the disc interspersed among the white spots and forming something like a fascia (abbreviated at both ends) immediately behind the white quasi-fascia; none of these markings however invade the actual suture which is fuscous. I have seen only a single specimen clearly presenting the above-described markings; the scales appear to be very deciduous and most examples are almost entirely of a pitchy black colour, the whitish fascia-like mark behind the middle of the elytra is, however, generally distinguishable.

S. Australia; near Port Lincoln.

DYSCHÆNIUM, gen. nov.

Corpus oblongum squamosum; oculi sat prominuli fortiter granulati infra distantes; rostrum sat validum arcuatum; scrobes ante-medianæ laterales; scapus oculum vix attingens; funiculus 6-articulatus; prothorax transversus ad latera fortiter rotundatis; scutellum distinctum; elytra prothorace sat latiora; pedes mediocres; femora postica subdentata; tibiæ anticæ apice haud mucronatæ; tarsi sat elongati, articulo 3° lato, 4° modice elongato; unguiculi simplices divaricati; abdominis segmenta 2 basalia conjuncta quam cetera conjuncta vix longiora, sutura prima arcuata; coxæ anticæ sat exsertæ vix contiguae, intermediæ distantes; prosternum ante coxas sat elongatum, antice vix emarginatum.

The 6-jointed funiculus of the antennæ, non-mucronate front tibiæ, and claw joint strongly exserted are characters that in combination will distinguish this genus from all previously described.

DYSCHÆNIUM FLAVUM, sp. nov.

Rufescens, elytris pallide flavis, rostri antennarumque apice ipso picescenti; squamis crassis elongatis setiformibus albidis (in elytris seriatim positis) sat dense vestitum, crebre sat

fortiter punctulatum, sculptura sub squamas abdita; rostro arcuato sat valido, prothorace vix longiori; hoc transverso antice angustato, margine antico haud elevato; elytris confertim striatis, interstitiis angustissimis.

[Long. $1\frac{1}{8}$, lat. $\frac{2}{3}$ line.

The elytra are peculiarly sculptured, bearing a great number of fine closely approximate striæ, the intervals between which are extremely narrow. In most examples the colour is pale reddish,—almost pink,—while the elytra are of a pale canary-yellow colour; in some examples the colour is entirely yellow, the scales however being always whitish.

S. Australia; Port Lincoln. By sweeping flowers. An example from King George's Sound appears hardly separable, though its prothorax is certainly somewhat more transverse.

MISOPHRICE.

For some of the species described below new generic names might perhaps be suitably provided, but I do not think that the omission to provide them will cause confusion, as the characters common to the species are extremely well-marked and unusual; the following in combination will distinguish them from all Australian *Curculionidæ* outside *Misophrice*;—Rostrum slender, not, or scarcely, shorter than prothorax; antennal funicle with only 6 joints; anterior coxæ contiguous; femora unarmed; tibiæ normally slender, mucronate (or at least submucronate); claw joint of tarsi wanting.

To Mr. Pascoe's diagnosis of the genus the following character may be added:—eyes finely granulated; it may also be remarked that in all the species of which I have seen more than one or two examples, I find the sexes distinguished by the presence or absence of a fovea on the apical ventral segment, and that the species having the prosternum very short anteriorly have the intermediate coxæ more widely separated than the other species have.

MISOPHRICE VARIABILIS, sp. nov.

Oblonga; supra ferruginea; antennis (articulis basalibus 2 exceptis), capite (rostro excepto), rostro apice ipso, elytrorum sutura et maculis vittiformibus nonnullis, piceis vel nigris; subtus picea, abdomine ferrugineo, pedibus ferrugineis (tarsis piceis exceptis); squamis albidis minus crebre vestita, his in elytris maculatione condensatis; rostro arcuato, minus valido, prothorace paullo longiori, supra longitudinaliter subtiliter 5-carinato, carinis apicem versus evanescentibus; antennis sat nitidis, rostri vix ante medium insertis, funiculi articulo 1° 2° et 2° 3° dimidia parte longioribus, articulis 3-6 obconicis inter se sat arcte conjunctis; prothorace leviter transverso, a basi ad apicem (vix arcuatim) angustato, sat fortiter punctulato, puncturis sub squamas abditis, basi bisinuato; elytris puncturis subquadratis sat magnis (in striis leviter impressis positis) instructis et setulis brevibus erectis vestitis; prosterno antice parum emarginato.

[Long. $1\frac{2}{3}$ -2, lat. $\frac{3}{8}$ - $\frac{1}{2}$ line (vix).

Var. Colore obscuro in elytris deficiente vel magis extenso.

The whitish scales on the elytra are placed on the interstices of the striae; in the anterior quarter they cover nearly the whole of the interstices, thence hindward assuming the form of subquadrate spots placed for the most part on the alternate interstices. In the type the blackish colouring occupies the suture widely, and forms a still wider vitta on the hinder part of the disc of each elytron; in one example before me this colouring is absent except on the suture where it is very faint, in another it is so extended that the elytron might almost be described as black with a line near the suture and the lateral margin ferruginous. The whitish patches of scales do not seem to vary. The basal two ventral segments are deeply impressed in the middle.

S. Australia; Port Lincoln; also at Petersburg.

MISOPHRICE ARGENTATA, sp. nov.

Oblongo-ovata; nigra; supra disperse subtus confertim argenteo-squamosa, squamis setuliformibus in elytris vittatim

condensatis ; supra (pedibus inclusis) pilis erectis nigris sat dense vestita ; rostro arcuato sat gracili, prothorace vix longiori, utrinque sat fortiter 2-sulcato, sulcis apicem versus evanescentibus, parte apicali sat fortiter punctulata ; antennis sat nitidis, rostri vix ante medium insertis, funiculi articulis 1-3 longitudine subæqualibus, ceteris nonnihil moniliformibus ; prothorace vix transverso, antice angustato, sat fortiter punctulato (puncturis sub squamas abditis), basi bisinuato ; elytris puncturis subquadratis sat magnis (in striis vix impressis positis) instructis apice submucronatis leviter dehiscentibus ; prosterno antice fortiter emarginato.

[Long. 2, lat. $\frac{4}{5}$ line (vix).

The silvery white scales on the elytra are condensed in vittæ on the alternate interstices of the rows of punctures and do not seem variable ; that on the interstice next the suture commences considerably behind the base ; the vittæ seem to be variously interrupted in different specimens, but I think this is always caused by abrasion. The shape and proportions of the joints of the funiculus are very different from those of *M. variabilis* in which those joints are wide at the base and a little dilated to the apex while here they are more turbinate, the apical 3 being almost moniliform. The basal ventral segments do not present any conspicuous depression.

S. Australia ; on *Casuarina* ; near Port Lincoln.

MISOPHRICE SUBMETALLICA, sp.nov.

Oblongo-ovata ; supra testacea, squamis setiformibus pallidis (his in elytris sparsim seriatim dispositis) vestita ; antennis (articulis basalibus 2 exceptis), rostro (hoc nonnullis exemplis apicem versus rufescenti), capite, prothorace, elytrorum sutura et spatio circa scutellum, piceis (nonnullis exemplis vix viridivul cupreo-micantibus) ; corpore subtus piceo, pedibus (tarsis piceis exceptis), abdomineque, testaceis ; rostro arcuato minus valido prothorace vix longiori, supra longitudinaliter subtiliter 5-carinato, carinis apicem versus evanescentibus ; antennis sat nitidis, rostri ad medium insertis, funiculi articulis

2° 3°que æqualibus, his conjunctis 1° æqualibus, ceteris obconicis inter se sat arcte conjunctis; prothorace vix transverso, a basi ad apicem (vix arcuatim) angustato, fortius sat crebre punctulato, basi leviter bisinuato; elytris puncturis sat crebris subquadratis minoribus (in striis leviter impressis positis) instructis; prosterno antice abbreviato, vix emarginato. [Long. $1\frac{1}{2}$ - $1\frac{2}{3}$, lat. $\frac{2}{3}$ line.

In all the specimens that I have examined of this species there is a conspicuous deep impression occupying the whole of the middle part of the basal two ventral segments.

S. Australia; near Port Lincoln.

MISOPHRICE OBLONGA, sp. nov.

Oblonga, postice haud latior; supra testacea, capite (rostro excepto), antennis (basi excepta), elytris circa scutellum et tarsis, piceis; subtus rufescens, pectore piceo-viridi; supra squamis suberectis pallidis minus conspicuis vestita; rostro arcuato minus gracili, prothorace haud longiori, supra minus convexo 5-carinato, carinis antice vix obsoletis; antennis sat nitidis, rostri paullo ante medium insertis, funiculi articulo 2° 3° paullo longiori, his conjunctis 1° æquali, ceteris transversis; prothorace vix transverso, a basi ad apicem (vix arcuatim) angustato, crasse crebre punctulato, basi vix manifeste bisinuato; elytris puncturis sat magnis subquadratis (in striis leviter impressis positis) instructis; prosterno antice abbreviato vix emarginato. [Long. 1 (vix), lat. $\frac{2}{3}$ line.

This species is very like *M. submetallica*, but I feel confident that it is not a mere variety. Apart from its very much smaller size and somewhat different colouring (the rostrum and prothorax being testaceous), it is very different in outline, the elytra not increasing in width behind the basal fifth part of their length and being gradually attenuated in the apical quarter. It is also to be noted that the rostrum is distinctly shorter and that the joints in the antennal funicle are somewhat differently proportioned. In the two examples that I have seen the basal two ventral segments are longitudinally concave as in *M. submetallica*.

S. Australia; near Port Lincoln.

MISOPHRICE MUNDA, sp. nov.

Oblonga, postice haud latior; supra testacea, capite, prothorace, antennis (basi excepta), elytris circa scutellum et in sutura, tarsisque, piceo-nigris; subtus piceo-nigra, abdomine rufo; supra squamis viridibus sat sparsim vestita; rostro arcuato, gracili, prothorace paullo longiori, supra obscure 5-carinato; antennis sat nitidis, rostri paullo ante medium insertis, funiculi articulis 2° 3°que inter se subæqualibus, his conjunctis 1° paullo brevioribus, ceteris transversis; prothorace leviter transverso a basi ad apicem vix arcuatim angustato sat crasse sat crebre sat rugulose punctulato, basi vix manifeste bisinuato; elytris puncturis sat magnis subquadratis (in striis leviter impressis positis) instructis; prosterno antice abbreviato vix emarginato. [Long. $\frac{9}{10}$, lat. $\frac{3}{10}$ line (vix).

Allied to the last preceding two species and differing from both in respect of the distinctly *green* scales thinly scattered over the surface,—more plentifully on the head, prothorax and base of the elytra than elsewhere and also in the differently proportioned joints of the antennal funicle. Differs from *M. submetallica* also by the elytra not being dilated posteriorly, by the much smaller size and by the antennæ being inserted well in front of the middle of the rostrum,—and from *M. oblonga* by the prothorax and rostrum being of a dark colour, the former being less narrowed anteriorly and slightly more transverse while the latter is more slender and elongate being somewhat longer than the prothorax (in *oblonga* not at all longer).

Western Australia; taken by E. Meyrick, Esq., near Perth.

MISOPHRICE SETULOSA, sp. nov.

Oblonga, postice vix latior; picea, antennarum basi, elytrorum disco, abdomine, femoribus, et nonnullis exemplis tibiis, plus minus testaceis vel rufescentibus; supra squamis viridibus sat sparsim, et setulis brevibus pallidis erectis sat crebre, vestita; rostro arcuato minus gracili, prothorace haud longiori, supra minus convexo 5-carinato, carinis antice vix obsoletis;

antennis rostri paullo ante medium insertis, cetera ut *M. submetallica*; prothorace sat transverso, sat crasse sat crebre sat rugulose punctulato, basi subbisinuato, lateribus leviter rotundatis; elytris puncturis sat magnis subquadratis (in striis modice impressis positis) instructis; prosterno antice abbreviato, vix emarginato. [Long. $\frac{1}{2}$ -1, lat. $\frac{3}{10}$ line (vix).

Allied to the last preceding three species but distinct from them all by its much darker colour and erect bristles which on the elytra run in longitudinal rows, and also by its shape, the elytra being more rounded on the sides and consequently not quite so wide near the base or behind the middle as in the middle. The rostrum is nearest to that of *M. oblonga*, while the antennae resemble those of *M. submetallica* in their short 2nd joint of funicle, &c. The green scales of the upper surface are considerably more conspicuous than in *M. munda*.

S. Australia; near Port Lincoln.

MISOPHRICE SQUAMOSA, sp. nov.

Oblonga, postice (fere ab elytrorum basi) attenuata; piceo-nigra, antennarum basi tibiisque plus minus rufescentibus; corpore supra pedibusque squamis fuscis griseisque, corpore subtus squamis argenteo-albidis (certo adaspectu subcupreis), densissime vestitis; rostro sat gracili, vix arcuato, prothorace parum longiori; longitudinaliter subtiliter 5-carinato, carinis apicem versus obsolete; antennis rostri paullo ante medium insertis, funiculi articulis 1-3 gradatim brevioribus, 4-6 3^o brevioribus nec transversis, clava basi subtubulato; prothorace sat transverso, a basi ad apicem sat arcuatim angustato, crebre fortiter subrugulose punctulato, basi vix bisinuato; elytris sat fortiter striatis, striis crasse obscure (sculptura sub squamis omnino abdita) punctulatis; prosterno antice (ut *M. variabilis*) minus abbreviato antice minus emarginato.

[Long. $1\frac{1}{2}$, lat. $\frac{7}{10}$ line.

There is little pattern on this insect; regarding the darker scales as the ground colour one observes two rather inconspicuous pale vittae on either side of the prothorax and single whitish scales

dusted over the elytra with a little tendency to run into longitudinal lines on the disc. The elytra immediately behind the base are considerably wider than the prothorax and are thence narrowed to the apex; the antennæ by their slender long-jointed funiculus resemble those of *M. argentata*,—the prosternum is like that of *M. variabilis*. The close even vestiture of scales without hairs or erect setæ and the nearly straight rostrum distinguish the present insect from all the preceding. The elytra are a little callous where the 5th 6th and 7th interstices terminate. The basal 2 ventral segments are (as in *M. argentata*) not longitudinally concave. Probably Mr. Pascoe would regard this species as requiring a new generic name.

S. Australia; a single example taken near Port Lincoln.

MISOPHRICE PARALLELA, sp. nov.

Sat angusta; subcylindrica, elytris prothorace vix latioribus; piceo-nigra; squamis pallidis (certo adspectu subcupreis) vestita, his in elytris seriatim dispositis, in prothorace corporeque subtus sat piliformibus; rostro sat gracili arcuato, prothorace parum longiori, longitudinaliter 5-carinato, carinis apicem versus obsoletis; antennis rostri parum ante medium insertis, funiculi articulis 2° 3°que longitudine æqualibus his conjunctis 1° brevioribus, ceteris submoniliformibus; prothorace vix transverso, antice subtubulato, crebre sat crasse rugulose punctulato, lateribus leviter rotundatis, basi vix bisinuata; elytris puncturis sat magnis subquadratis (in striis modice impressis positis) instructis; prosterno antice minus abbreviato, leviter emarginato.

[Long. 1, lat. $\frac{3}{10}$ line.

This species has very much the appearance of a *Tychius*. Its subcylindric appearance distinguishes it at once from all the other described species of *Misophrice*. I have little doubt that Mr. Pascoe would make a new genus for it. The basal two ventral segments are gently concave longitudinally. There is no fovea on the apical ventral segment of the specimen before me.

S. Australia; a single example taken near Port Lincoln.

The following tabulation will suffice to separate the species described above:—

- A. Prosternum very short (almost linear) and scarcely emarginate in front of the anterior coxæ.
 - B. Body not clothed above with erect bristles.
 - C. Rostrum and prothorax not of an uniform testaceous or red colour.
 - D. Antennæ inserted considerably in front of middle of rostrum *munda*.
 - DD. Antennæ inserted at or close to the middle of rostrum..... *submetallica*.
 - CC. Rostrum and prothorax of an uniform testaceous or red colour..... *oblonga*.
 - BB. Body densely clothed above with very short erect bristles *setulosa*.
 - AA. Prosternum moderate in front of anterior coxæ and at least moderately emarginate in front.
 - B. Body not clothed with close-set bristles above.
 - C. Elytra much wider than prothorax. Basal two ventral segments longitudinally concave *variabilis*.
 - CC. Elytra much wider than prothorax. Basal two ventral segments not longitudinally concave..... *squamosa*.
 - CCC. Elytra scarcely, if at all, wider than prothorax *parallela*.
 - BB. Body densely clothed with erect bristles above..... *argentata*.
- N.B.—*M. hispida* (the only previously described *Misophrice*) is a species bearing long erect setæ, and having a large snowy white spot on the side of each elytron.

ANARCIARTHREM, gen.nov.

Corpus ovale, subcylindricum; oculi minus convexi, sat fortiter granulati, ovales, infra distantes; rostrum gracile,

elongatum, arcuatum, supra basin versus longitudinaliter striolatum; scrobes postmedianæ, laterales; scapus oculum attingens; funiculus 5-articulatus, articulis 1° 2° 3°que conjunctis vix longiori; clava distincta; prothorax subconica, basi subtruncatus; scutellum minutissimum; elytra sat elongata, prothorace parum vel modice latiora; pedes mediores; femora mutica, in medio incrassata; tibiæ intus vix flexuosæ, anticæ intus angulatim dilatatæ sed vix mucronatæ; tarsi 3-articulati; abdominis segmenta 3^{um} 4^{um} que conjuncta 2° vix breviora, sutura prima parum arcuata, suturis intermediis ad latera angulatis; coxæ anticæ contiguae, intermediae subapproximatæ; prosternum antice breve vix emarginatum.

It is very difficult to form a decided opinion as to the affinities of the insect for which I propose this name. Superficially it looks as if it might well stand in the same genus as *Misophrice parallela* (which species I have remarked above does not seem at home in *Misophrice*) but its 5-jointed funiculus is inconsistent with such a conjunction. This latter character is suggestive of relation to *Cionus*, but I do not find other characters to confirm the suggestion. The pygidium is entirely covered by the elytra and the *metasternum* is moderately elongate. The *Erirhinides* and *Tychiides* would seem to have almost equal claims to a clawless species, but as none such have hitherto been actually attributed to the latter tribe and as the genera belonging to it usually show peculiarities about the ventral sutures of which I find no indication in the insect before me, I think this genus had better be regarded as an *Erirhinid* with exceptional antennæ as well as exceptional tarsi.

ANARCIARTHURUM VIRIDE, sp. nov.

Ovale (mare quam femina angustiore et magis parallelo); piceum, squamis læte viridibus (in elytris lineatim positis) vestitum, antennis basi et nonnullis exemplis rostro pedibusque anticis, rufescentibus; rostro quam prothorax (maris paullo, feminae fere duplo) longiori; antennis paullo pone rostri medium insertis; prothorace vix transversa, a basi ad apicem

(vix arcuatim) angustato; elytris sat fortiter punctulato striatis, interstitiis sat planatis. [Long. $1\frac{1}{2}$, lat. $\frac{2}{3}$ line.

The basal ventral segment bears a semi-circular impression which is continued feebly on the 2nd segment. The 5th ventral segment is not foveated in either sex, but in the sex with the longer rostrum it is emarginate on its hind margin, with what appears to be a minute additional segment beyond.

PHYTOPHAGA.

CHALCOMELA SLOANEI, sp. nov.

Rotundata; valde convexa; nitida; subtus nigra; suprapicea, viridi et purpureo obscure micans, antennis palpis pedibusque rubis; elytris sat fortiter punctulato striatis, interstitiis sub-convexis. [Long. 3, lat. $2\frac{2}{3}$ lines.

The head is impunctate or nearly so; it bears a very deep transverse angulated furrow dividing the clypeus from the forehead and a feebler longitudinal furrow running down the forehead. The prothorax is nearly three times as wide at the base as it is long down the middle, it is narrowed and gently rounded from

ATERATOCERUS, gen.nov.

Palpi maxillares ut *Cyclomelæ*; antennæ robustæ, articulis 3-11 sat fortiter compressis; oculi ovales transversi minus fortiter granulati; acetabula antica postice late aperta; metasternum elongatum; unguiculi appendiculati; corpus elongato-oblongum; segmento ventrali apicali postice fortiter multispinoso.

It is rather difficult to say where this genus should be placed in Lacordaire's arrangement, but perhaps it would be most at home among the "*Australicites*." It differs from *Calomela* in its elongate more fragile facies, and in its claws not bifid but appendiculate. The stout unicolorous metallic antennæ, colouring, and style of markings of the species before me are suggestive of *Phyllocharis*, but the anterior coxæ widely open behind separate it at once from that genus.

ATERATOCERUS INTRICATUS, sp.nov.

Elongato-oblongus; nitidus: læte rufus; antennis nigro-violaceis, femoribus tibiisque plus minus piceo-violaceo-micantibus, elytris intricate piceo maculatis fasciatisque; capite lævigato inter oculos profunde impresso, vertice subtiliter longitudinaliter canaliculato; prothorace quam longiori plus duplo latiori, vix perspicue punctulato, antici angustato, lateribus leviter convexis, angulis sat acutis, base leviter convexa, margine antico fortiter concavo; elytris pone basin latera versus late transversim impressis, seriatim punctulatis, puncturis nisi antice suturam versus et in impressione transversa vix perspicuis.

[Long. $2\frac{3}{5}$ - $3\frac{2}{5}$, lat. $1\frac{2}{5}$ -2 lines.

The basal joint of the antennæ is short and piriform, joint 2 much smaller still, 3 as long as 1 and scarcely compressed, 4 scarcely different from 3, 5-8 decidedly and increasingly compressed, 9-11 each almost identical with 8 except that 11 bears at its apex a small narrower piece which has all the appearance of a 12th joint. The piceous markings on the elytra are quite similar

in the two examples before me, but they are intricate and difficult to describe. The anterior two-thirds of the lateral margin is widely and unevenly piceous; a little in front of the middle a rather faint narrow transverse fascia runs from this margin to the suture, close to which it becomes wide and strongly coloured; at the apex of the piceous margin another transverse fascia of zig-zag form runs across the elytra and, close to the apex of the elytra, a third; there is a common piceous spot around and including the scutellum, and a smaller one on each elytron immediately in front of the middle of the anterior fascia. A round and rather deep but not large fovea is impressed on the base just within the shoulder. The hind margin of the apical ventral segment is cut all across into a close series of spines or sharp teeth; it is possible that this is a sexual character. The claws are like those of *Chalcolampra*.

N.S.W., Richmond River; sent to me by Mr. T. G. Sloane.

CALOMELA FLAVESCENS, sp.nov.

Elongata; subparallela; flavo-testacea; nitida; labro

upper side of the basal joints and the apex of the rest fuscous or blackish, and the basal portion of the joints about the middle are infusate in a less degree. These colour differences would not be sufficient to justify specific distinction, however, were it not for differences of sculpture, but in *pallida* the head is said to be coarsely punctured and the puncturation of the prothorax to be sub-variolose at the sides, whereas in the present species both head and prothorax are very finely and very evenly punctured, the punctures of the latter being scarcely if at all coarser on the sides than on the disc. The other species of *Calomela* approaching this one in colour are *geniculata*, Baly, *tarsalis*, Blackb., and perhaps *paropsoides*, Clk.; of these the former two, *inter alia*, have black tarsi, while the last named has the prothorax strongly punctured at the sides and the elytra marked with fuscous blotches.

N.S.W., Richmond River; sent by Mr. T. G. Sloane.

AULACOPHORA AUSTRALIS, Blackb.

The same year (1888) in which I described the above-named insect to the Linnean Society of N. S. Wales, Mr. J. S. Baly, I find, described it to the Linnean Society of London under the name *Aulacophora Olivieri*. As Mr. Baly's description was published a little before mine his name must stand. In the same memoir Mr. Baly describes Malayan specimens which he says are the true *A. analis*, Weber, and shows that they are quite distinct from any species hitherto recorded as Australian, the specimens on the authority of which Olivier quoted Australia as a locality for *analis* being in reality this allied species which Mr. Baly and I described almost simultaneously. *A. analis*, Weber, must therefore be dismissed from the Catalogue of Australian Coleoptera, and the insect that has borne that name will stand thus—

A. OLIVIERI, Baly, Journ. Linn. Soc. XX. (1888), p. 184.

australis, Blackb., Proc. L.S.N.S.W. (Ser. 2) Vol. III. (1888), p. 1498.

analis, Oliv. (nec Weber), Ent. VI. p. 642, t. 3, f. 48.

? *hilaris*, Boisd., Voy. de l'Astrolabe, p. 555.

My note in Proc. L.S.N.S.W. (1889, p. 1273) to the effect that *A. australis*, Blackb., appeared to be a var. of *analis*, was

founded on Olivier's erroneous statement to that effect, but there seems to be no doubt whatever that Mr. Baly is right in his conclusions. It is quite likely that *A. Olivieri* may be *hilaris*, Boisd., but this could only be determined by reference to the type if still in existence.

AULACOPHORA RICHMONDENSIS, sp. nov.

Oblongo-ovata; convexa; nitida; flava, labro, mandibulis apice, antennis (basi excepta), metasterno, tibiis (basi excepta), tarsis et elytrorum fasciis 2 latis (altera recta basali, altera arcuata pone medium) nigris aut nigro-piceis; prothorace quam longiori fere duplo latiori transversim sulcato, antice latera versus sparsim fortiter punctulato; elytris tenuiter punctulatis.

Maris segmento ventrali apicali 3-lobato, lobo intermedio toto longitudinaliter profunde concavo.

Feminae segmento ventrali apicali aequali, postice rotundato.

Var. metasterno flavo. [Long. 3-3½, lat. 1½-2 linea

The eyes are connected by a transverse furrow, immediately above the middle of which is a deep fovea. The antennae are not different in the sexes. The basal joint (and in some examples the second and even the base of the third) is more or less rufous; joints 3 and 4 are equal *inter se*. The prothorax is punctured very finely and sparsely except towards the sides of the portion in front of the transverse furrow where the puncturation is strong and conspicuous.

The previously described Australian species having yellow elytra with large black markings are *Olivieri*, Baly, *pectoralis*, Jac., *Cartereti*, Guér., and *hilaris*, Boisd., (not recognizably described). Of these the first has antennae totally different from those of the present insect, the black markings not forming continuous fasciae on the elytra, &c.,—the second (from Cape York) has "the prothorax impunctate,"—the third (known I think only by a very poor description) has antennae "at least as long as the body" (in this species they reach little behind the middle of the elytra), "thorax a little wider than long" (in this species all but twice as wide as long), yellow legs, &c. The Malayan *A. analis*, Weber,

has (according to Mr. Baly) *inter alia* the apical ventral segment quite different in both sexes,—and the other Malayan species (I think I have seen at least descriptions of them all) all differ in well marked characters. A species from Cape York which Mr. Jacoby thinks may be *A. affinis*, Montrouz., has *inter alia* the hind legs entirely black.

N. S. Wales; Richmond River district; sent by Mr. T. G. Sloane.

AULACOPHORA WILSONI, Baly.

Mr. Sloane has sent me from the Richmond River district a single specimen (female) which seems to be this insect,—described on specimens from Melbourne. My example does not quite fit the description in respect of colour, being brownish-testaceous rather than flavous and having the disc of the elytra vaguely infuscate, but I can find no other distinction. It appears to me that *A. scutellata*, Boisd., might be this insect, but the description (of half a dozen words) is perhaps unworthy of attention.

HOPLOSTINES, gen.nov.

Corpus oblongum, robustum, glabrum; oculi integri sat convexi; antennæ robustæ filiformes, corporis dimidio vix longitudine æquales, articulo 1° 4° æquali quam 3^{us} breviori; prothorax transversus; elytrorum epipleuræ fere ad apicem bene distinctæ; tibiæ extus longitudinaliter sulcatæ, apice mucronatæ, anticarum mucrone brevi valido uncinato; tarsorum posticorum articulus 1^{us} 2° 3° que conjunctis vix æqualis; unguiculi bifidi; acetabula antica postice angustissime clausa.

The insect for which I propose this new generic name cannot be placed in any of the numerous genera of *Galerucidæ* formed by Messrs. Baly, Jacoby, and others since Dr. Chapuis' work on the subfamily in the "Genera des Coléoptères." In Dr. Chapuis' tabulation of the genera of *Galerucides* it would fall in the *Sermylites*.

HOPLOSTINES VIRIDIPENNIS, sp.nov.

Testacea, antennis labro mandibulis palpis abdominis parte media tibiæ apice tarsisque infuscatis, elytris læte

viridibus, capite postice nigro; hoc longitudinaliter fortiter sulcato, antice (parte testacea) coriaceo, postice (parte nigra) crassissime rugulosissime punctulato; prothorace quam longiori duplo latiori, crassissime rugulose nec profunde punctulato, antice quam postice sat angustiori, disco utrinque impresso, margine antico subtruncato, angulis anticis dentiformibus, posticis acute rectis, lateribus ab angulis anticis fere ad medium divergentibus (hic subangulatis), hinc ad basin subparallelis, basi ad latera (manifeste) et in medio (sat obsolete) emarginata; elytris sat late marginatis, crebre aspere fortiter punctulatis; segmento ventrali (?maria) longitudinaliter carinato, apice elevato-emarginato.

[Long. 3, lat. 1½ lines.

The elytra are of a somewhat unusual colour—a bright pale green.

N. S. Wales; Richmond River district; sent to me by Mr. T. G. Sloane.

MENIPPUS ELEGANS, sp. nov.

Elongato-oblongus; sat robustus; albido-pubescent; testaceus; capite postice, antennis (articulorum basaliū basi excepta), in prothorace maculis nonnullis, metasterno, abdomine in parte, femorum apice, tibiis, tarsisque, infuscatis vel nigris; elytris læte viridibus; antennis robustis, corporis dimidio vix longitudine æqualibus, articulo 1º 3º sat æquali, his 4º paullo longioribus; prothorace quam longiori duplo latiori, antice quam postice paullo latiori, ante medium fortiter inæqualiter transversim sulcato, a sulco ad basin in medio longitudinaliter impresso, sulco et spatio depresso maculatim infuscatis; lateribus bisinuatis antice haud marginatis, angulis anticis obscuris, posticis obtusis, basi leviter trisinuata; capite postice confertim crasse rugulose, prothorace crassissime rugulose minus crebre, elytris confertim rugulose subtilius, punctulatis; elytrorum epipleuris multo post medium continuatis; tibiis extus longitudinaliter sulcatis, apice intus inermibus; unguiculis in medio breviter acute dentatis, fere sublibellis. [Long. 3½, lat. 1½ lines.

The structure of the claws, which can hardly be called genuinely bifid, appears hardly consistent with a place in *Menippus*, but I can find no other structural peculiarity, and the divergence is not greater than is found in the claws of various species of *Galeruca*. This species bears a singular superficial resemblance to the preceding one.

Australia; I am doubtful of the exact habitat, but I believe it to be in N. S. Wales.

MENIPPUS QUADRINOTATUS, sp.nov.

Elongato-oblongus; pubescens; fuscus, antennis (basi exceptis) tibiis tarsisque plus minus obscurioribus, elytris singulis maculis 2 (altera minori humerali altera majori elongata laterali apicem versus posita) cyaneis; antennis sat robustis, articulis 1° 3° 4° que inter se sat æqualibus, 2° multo breviori; prothorace quam longiori duplo latiori (basi margini antico latitudine æquali), transversim sulcato (sulco medio subobsoleto), confertim minus fortiter punctulato, lateribus sat æqualiter rotundatis antice vix perspicue marginatis; elytris confertim aspere subtilius punctulatis; unguiculis subbifidis. [Long. 3 $\frac{3}{8}$, lat. 1 $\frac{1}{2}$ lines.

A very distinct species, not very like any other known to me, but with generic character normal.

Australia; I believe this insect is from the central tropical region.

CANDEZEA SCULPTA, sp.nov.

Ovata, elytrorum partibus duabus anticis antrorsum declivibus; glabra; fusca (? exempli recentis colore pallidiori); in capite prothoraceque maculis nonnullis, in elytro singulo macula magna circuliiformi (basin, suturam et marginem lateralem attingenti), scutello, sternis, maculis transversis nonnullis in segmentis ventralibus positis, et femoribus (his apice pallidioribus), nigris vel nigro-piceis; antennis sat gracilibus sat elongatis, articulo 1° elongato quam 2^{us} plus duplo longiori, 3° 4° que inter se sat æqualibus utroque quam 2^{us} fere duplo longiori; capite vix punctulato, inter oculos transversim sulcato sulco medio foveiformi antice producto;

prothorace quam longiori tertia parte latiori, minute coriaceo et sparsim vix manifeste punctulato, ad angulos anguste deplanato, pone angulos posticos late lobato, basi margini antico latitudine subæquali, lateribus arcuatis, angulis anticis lateraliter sat productis, posticis obtusis; scutello sat magno triangulari; elytris sat crebre sat leviter minus minute subseriatim punctulatis, inter puncturarum series subcoactis, in partibus nigris subdepressis; tarsorum posticorum articulo 1^o quam ceteri conjuncti sat longiori; unguiculis intus late dentatis; acetabulis anticis postice clausis; elytrorum epipleuris post medium continuatis; tibiis mucronatis.

[Long. 3½, lat. 1½ lines.

This species is evidently congeneric with the two that I described as *C. Palmerstoni* and *Bovilli* (in Trans. Roy. Soc. S.A., XI. pp. 178-9) though specifically it is extremely distinct from them. Specifically it must be very near *C. bimaculata*, Jac., (from New Guinea); indeed I should hesitate to distinguish it from that insect if its author had not described its elytra as having only "a few scarcely visible punctures." It is probable that the example before me is discoloured owing to defective preservation and that its pale fuscous or drab tint has been brighter when it was fresh. The specimen appears to be a female and (perhaps owing to its being dilated with ova) its elytra are strongly dilated upwards as well as laterally almost to the apex so that viewed from the side the curve of the upper outline is very strong and its highest point is near the apex. The blackish ring on the anterior ¾ of each elytron is somewhat impressed (as though branded on the surface), the included space consequently appearing to be slightly tumid.

Queensland; Bellenden-Ker Ranges; taken by Mr. F. M. Bailey, Queensland Government Botanist.

MONOLEPTA ROSEA, sp. nov.

Testacea, antennis apicem versus metasternoque nigris vel piceis, elytrorum basi et macula discoidali paullo pone medium posita) læte roseis; capite vix manifeste punctulato, longitudinaliter subtiliter canaliculato, antennis corporis dimidio sat longioribus articulis 1^o 4^o 5^o que inter se sat

æqualibus, his singulis 2° 3° que conjunctis æqualibus, hoc quam ille sat longiori; prothorace subtilissime coriaceo et sparsim obsolete punctulato, quam longiori fere dimidia parte latiori, antice vix angustato, ad angulos obscure anguste deplanato, pone angulos anticos late lobato, lateribus arcuatis, angulis anticis minus distinctis posticis subrectis; scutello triangulari; elytris sat crebre minus subtiliter punctulatis, tibiis mucronatis, tarsorum posticorum articulo 1° quam ceteri conjuncti sat longiori; unguiculis appendiculatis; acetabulis anticis postice clausis, elytrorum epipleuris sat longe ultra medium continuatis. [Long. 2½, lat. 1½ lines.

The rosy colour at the base of the elytra extends to about one-fifth of their entire length and is faintly continued hindward some distance further along the margin. This species must be near the Malayan *M. basalis*, Jac., and *affinis*, Jac., but *inter alia* in neither of those does there appear to be any red spot on the disc of the elytra, and both have a wider prothorax, that of *affinis* being "twice as broad as long" and that of *basalis* still wider; while in the present species the width is scarcely more than half again the length. The basal joint of the hind tarsi is more than half as long as the hind tibiæ. The fourth joint of the antennæ is slightly longer than either the 1st or the 5th.

Australia; I am not sure of the exact habitat but believe it to be in the central tropical region.

MONOLEPTA NIGRICORNIS.

Nigra; nitida; prothorace femoribus et tiliarum basi læte flavis; capite vix punctulato inter oculos fortiter transversim sulcato; antennis corporis dimidio paullo longioribus, articulis 1° 4° 5° que inter se æqualibus, his singulis quam 2^{us} 3^{us} que conjuncti vix brevioribus, 2° sat dilatato (? alterutrius sexus solum) quam 3^{us} breviori; prothorace vix manifeste punctulato, quam longiori paullo latiori, antice vix angustato (latitudine majori ante medium posita), supra irregulariter depresso (? exemplo deformi), pone angulos posticos leviter late lobato, lateribus minus arcuatis, angulis anticis minus distinctis

posticis minutis subrectis ; scutello triangulari ; elytris sparsim subtiliter punctulatis ; tibiis mucronatis (anteriorum mucrone brevi inconspicuo) ; tarsorum posticorum articulo 1° ceteris conjunctis æquali ; unguiculis appendiculatis ; acetabulis anticis postice clausis ; elytrorum epipleuria longe ultra medium continuatis. [Long. 1½, lat. ¼ line.

N.S.W. ; Bulli ; sent by Mr. T. G. Sloane.

ENDOMYCHIDÆ.

MYCELLA CLAVICORNIS, sp. nov.

Nigro-æenea, prothorace femoribusque (his basi picea excepta) rufis ; subtilissime sat crebre punctulata ; prothorace quam breviori fere duplo latiori ; antennis corpore vix tertia parte brevioribus, clava compressa, articulis ultimis 2 sat fortiter transversis. [Long. 3½, lat. 2 lines.

The prothorax is of about equal width across the base and the front ; the latter is very strongly concave the front angles being much produced but not sharp ; the sides are gently convex from the front to behind the middle and thence slightly concave to the base which is nearly straight but with the hind angles (which are rather sharp) slightly produced hindward and outward ; the disc is moderately convex ; the lateral portions are considerably explanate with a well-defined thickened margin which is continuous across the base where it is preceded by a narrow deep transverse furrow. The elytra at their widest part (the middle) are quite twice as wide as the prothorax ; they are less than half again as long as their greatest width and their sides are strongly rounded. The last ventral segment is emarginate in the middle, the emargination being preceded in one sex by a longitudinal keel. The 2nd joint of the tarsi is certainly not longer than wide, but in spite of this character being at variance with Dr. Chapuis' diagnosis of the genus, I think I have rightly placed this species, which seems to be very different in colour and absence of marking from *M. lineella*, Chap., the description of which deals with colour and markings only.

N. S. Wales ; sent to me by Mr. Duboulay and also by Mr. Sloane (Richmond River).

NOTES ON AUSTRALIAN ABORIGINAL STONE WEAPONS AND IMPLEMENTS.

BY R. ETHERIDGE, JUN.

(PALEONTOLOGIST TO THE AUSTRALIAN MUSEUM, AND GEOLOGICAL
SURVEY OF NEW SOUTH WALES.)

v.—*Chips used in wood carving by the Marathon Tribe, Central
Queensland.*

(Plate XIII., fig. 13.)

The two chips exhibited were given to me by Mr. George Sweet, of Brunswick, Melbourne, who saw them used by "Old Jerry," of the Telebra Tribe, at Marathon, Central Queensland, to produce the indented lines ornamenting wooden weapons. They are composed of a black brecciated chert, with a glossy lustre and a subconchoidal fracture, but appear to have been fortuitous fragments chipped from larger masses, and are more or less triangular in form. Large numbers of such chips are found in some districts of Australia, often at great distances apart, and their application has been so variously assigned, such as for cutting scars, skinning, as fragments of tomahawks, and for making jagged spears, that it is satisfactory to be able to figure fragments which have been actually seen in use for a definite purpose. A very interesting account of the distribution and mode of occurrence of similar chips over the surface of some parts of Victoria may be found in the late Mr. R. B. Smyth's "Aborigines of Victoria." *

Mr. Sweet informs me that the chips are held tightly between the fingers of the right hand, the weapon to be worked reposing in the left, and supported on the left arm. The chip is then used as a chisel, the carving, in the practised hand of the black, proceeding with great rapidity.

This method of hand-carving is quite different to that pursued by the Victorian natives by means of the implement called the

* Vol. I., 1878, p. 361.

leange-walert, formed of the lower jaw of an opossum, and described by the late Mr. R. B. Smyth.*

vi.—*An apparently undescribed form of Stone Axe.*

(Plate XII., fig. 14.)

The following very remarkable form of stone hatchet or tomahawk is, so far as I know, unnoticed. It consists of a head of stone, perfectly resembling in shape the previously described Mika-knives,† but composed of a hard, close-grained, rather flesh-coloured granular quartzite, and produced by fracture. The heads, of which there are two, are generally similar to the stone-headed spears from North Australia, figured by the late Mr. R. B. Smyth,‡ similar Australian weapons, illustrated by Mr. J. G. Wood, M.A.,§ but without locality, and the obsidian spear-heads of the Admiralty Islands.

One of the axe-heads is eight inches long, and the other seven inches; the longer being two inches wide at the base, and the shorter two and a quarter inches. One face of each is practically flat, the other strongly angular in the middle line. In the shorter of the two this line is replaced by a facet towards the base of the axe. The heads are mounted in withys, artificially grooved, and passed round their bases, formed of some tough fibrous plant, and secured by a mass of black gum. One of the handles is nineteen inches long, and the other eighteen, the two parts being held together near the middle, and at the free extremities, which are pointed, by string, again secured by gum. On the whole, these weapons, although ill-balanced, are formidable, and capable of dealing a most destructive blow.

This appears to be quite an exceptional form of tomahawk amongst the Aborigines, and is an adaption for this purpose of a spear-head pattern. The shape is clearly that of the Mika-knives, but the weight, proportions, and size are altogether different. I am not acquainted with the figure of such a hatchet, but Smyth

* "Aborigines of Victoria," 1878, I., p. 349, f. 164.

† See Proc. Linn. Soc. N. S. Wales, *antea*, p. 251.

‡ "Aborigines of Victoria," 1878, I., p. 308, f. 85.

§ "Nat. Hist. Man. Australia," &c., 1870, p. 38, f. 4 & 5.

gives* an illustration of a similar head, made of an identical rock, mounted with gum at the end of a handle made of a single piece. The entire weapon, handle and head, only measures eight inches in length, and is therefore much smaller than the present form. It is called by Smyth a "stone knife," and is used by the inhabitants of Booloo and Cooper's Creek. Amongst the Mika-knives presented to the Australian Museum by Mr. Dunlops is an unhafted blade, preserved in a bark sheath, made of a similar granular, flesh-coloured quartzite to the above, but having the proportions of the other undoubted Mika-knives, and not of the present weapons. It is much too coarse in texture, and rough on the edge, to be employed in a similar manner, and is, therefore, in all probability, a smaller unmounted example of the present hatchet. It is four and a half inches long by two wide.

The method of hafting clearly marks these weapons as axes, or hatchets, but the entire departure from the ordinary form of *Mogo*, or tomakawk, is a very interesting point. The two halves of the handles are twice tied, as is usual in such weapons, but in the middle and at the end, instead of under the head and at the end.

vii.—*Stone axe-heads from the Lennard River, King's Sound,
N. W. Australia.*

(Plate xiv., fig. 15.)

I am indebted to the kindness of Mr. W. W. Froggatt for an opportunity of describing a suite of five stone axe-heads from the Lennard River, obtained by him during his late collecting tour in that district. The axe-heads are all of one type, and formed from selected oblong flattened pebbles. They are all more or less ground towards the cutting extremity, but it would appear that the original thickness and bulk of the pebbles has been reduced by knocking off flakes, especially in the two smaller specimens. Two still bear traces of the gum used for mounting them in their handles, and one is very slightly grooved for the reception of its hafting. The stones employed are a dense black basalt, but before manipulation the pebbles had evidently undergone much fluvial action. The measurements of the three largest are as follows:—

* "Aborigines of Victoria," 1878, II., p. 380, f. 200.

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	Length.	Breadth.	Thickness.	Weight.
1.....	7"	4"	$1\frac{5}{8}"$	1 lb 1 oz.
2.....	6"	$3\frac{1}{2}"$	$1\frac{1}{8}"$	1 lb
3.....	$5\frac{1}{4}"$	3"	$1\frac{1}{8}"$	13 oz.

The largest is really a fine weapon, but neither this nor any of the others can lay claim to that excellency of finish displayed by many of the tomahawks of Victoria and New South Wales. The curve of the cutting edge, it is true, is fairly good, but the grinding to produce the bevel has been roughly executed.

In their peculiarly flattened and oval form these axe-heads resemble weapons figured* by Smyth from Lake Tyers, but the disposition of the cementing gum indicates that our axe-heads were single, not double, as in the case of those from that locality; another figured by Evans† from "Northern Australia;" and also another by Smyth‡ from the Burdekin River, North Queensland, but with stronger traces of percussion in its manufacture.

viii.—*A Talismanic Stone, or Teyl, from Cooktown.*

It has long been known that the "Coradges," priests, or "medi-

size of a cricket ball, carried in a small net suspended from the girdle, and called *mur-ra-mai*. By the Sydney blacks such stones were known as *krardgee-kibba*, or Doctor stone; by the *Yan*, Murrumbidgee, and Tumut Aborigines, they were termed *merudagalle*. * In the Murrumbidgee tribes the stones are said by Mr. J. Manning† to descend from father to son, and to give semi-divine authority. According to Dr. John Fraser‡ similar pieces of rock crystal were used in the ceremony of the Bora, one or more pieces being given to the *bombat* or novice. This took place in the Yuin tribe on the S.E. coast.

The specimen now in my hands was obtained by Mr. George Sweet, of Brunswick, Melbourne, at Cooktown. The use of these talismanic stones so far north is already known, Leichhardt having recorded their use on the Lynd River.§ Mr. Sweet's specimen consists of a compound prismatic crystal of quartz, frosted and opaque at the base, but clear towards the apices of the pyramids, and more or less transparent. It measures three and a half inches in length, is one and a half inches in diameter, and weighs four and a half ounces. This quite equals in size the stone described by the Rev. Dr. Turner, Bishop of Grafton and Armidale,|| obtained from a dilly-bag at Armidale, measuring $3\frac{1}{4}$ in. \times $1\frac{1}{4}$ in. \times 3 in.; or the still larger egg-shaped stone described by Smyth¶ from Gippsland, four inches in length, and two and a half in breadth, and called *bulk*. The almost universal use of these talismanic stones throughout Australia is a point of great interest.

ix.—*Pigment Ochres from the Lennard River, King's Sound,
N. W. Australia.*

The colours formerly employed by the Aborigines in the ornamentation of their weapons and implements, and adornment of

* Bennett, "Wanderings in Australia," 1834, I., p. 191.

† Journ. R. Soc. N. S. Wales for 1882 [1883], XVI., p. 161.

‡ Journ. R. Soc. N. S. Wales for 1882 [1883], XVI., p. 207.

§ "Journal of an Overland Expedition in Australia from Moreton Bay Port Essington," 1847, p. 270.

|| Proc. Linn. Soc. N. S. Wales for 1885 [1886], X., pt. 2, p. 188.

¶ "Aborigines of Victoria," 1878, I., p. 386.

their bodies, were black, white, red, and yellow. These colours were usually derived from the decomposition of certain rocks resulting in the formation of clays. Yellow, red, and white were generally used for painting the person, and the two latter colours for weapons, although the first was employed at times, especially according to Smyth, throughout Northern Australia.

Mr. Froggatt has brought both red and yellow colour-stones from the Lennard River, taken from the dilly-bags of the Aborigines. The former consists of a highly ferruginous blood-red gritty rock, which, from the rounded condition of its edges, shows that it has undergone a good deal of friction, and in its present shape and condition resembles a piece of french-chalk, as used by clothiers for marking cloth. The latter is simply a small semi-decomposed ironstone nodule, the concentric layers still showing on a fractured surface. The edges of this specimen have all the appearance of having been cut with some sharp instrument.

EXPLANATION OF PLATES.

- Fig. 13.—Chip used by Marathon blacks for carving wooden implements.—
Coll. Sweet, Melbourne; Mining and Geol. Mus. Nat. size.
- Fig. 14.—Undescribed form of Stone Axe, formed of a flesh-coloured
quartzite, and mounded in a withy wound round it; North
Central Queensland.? Coll. Australian Mus. Little less
than half nat size.
- Fig. 15.—Head of Tomahawk of black basalt; Lennard River, Kimberley.—
Coll. Froggatt. Slightly reduced.

DIPTERA OF AUSTRALIA.

BY FREDERICK A. A. SKUSE.

NEMATOCERA.—SUPPLEMENT I.

(Plate xvi.)

Since the publication of the first and subsequent numbers of this series of memoirs a very considerable amount of new material has been accumulated from various sources, including new and unrecorded genera and species relating to nearly every family of the division Nematocera. Descriptions of some of these, together with notes and corrections concerning those previously characterised, are commenced with this Supplement.

I am indebted for much of the material at my command to the courtesy of the Trustees of the Australian Museum, Sydney; Prof. McCoy, Director of the National Museum, Melbourne; Mr. De Vis, Curator of the Queensland Museum, Brisbane; Mr. J. G. O. Tepper, of the Adelaide Museum, South Australia; Mr. Henry Tryon, of the Queensland Museum; Mr. W. W. Froggatt, of the Macleay Museum; and Mr. R. Helms, of the Australian Museum. The sources from which specimens have been received and the collectors' names are appended to the descriptions.

The present Supplement deals with the families Cecidomyidæ and Sciaridæ. Thirty-one new species are described; three genera, *Spaniocera* and *Lestremia* (Cecidomyidæ), and *Zygoneura* (Sciaridæ), are recorded for the first time from Australia; and some interesting galls of Cecidomyidæ are described and figured.

Fam. CECIDOMYIDÆ.

Sub-fam. I. CECIDOMYINA.

Genus CECIDOMYIA, Meig.

Cecidomyia, Meig., Proc. Linn. Soc. N.S.W., (2), III. p. 60, 1888.

Sub-genus *CECIDOMYIA*, Loew.*Cecidomyia*, Loew, l.c., p. 61.*a. Flagellar joints of the antennæ pedicelled in ♂, and sessile in ♀.*432. *CECIDOMYIA ACACIE-LONGIFOLIE*, sp.n. (Pl. xvi., figs. 1-1b.)

♂.—Length of antennæ..... 0·060 inch ... 1·54 millimètres,
 Expanse of wings..... .. 0·090 × 0·040 ... 2·27 × 1·01
 Size of body.... 0·105 × 0·020 ... 2·67 × 0·50

♀.—Length of antennæ..... 0·037 inch ... 0·90 millimètre.
 Expanse of wings..... 0·105 × 0·042 ... 2·67 × 1·06
 Size of body..... 0·110 × 0·027 ... 2·79 × 0·68

Antennæ black or dark brown, 2-+16-jointed in both sexes; in ♂ flagellar joints longer than broad, about twice the length of pedicels, verticils greyish, moderately dense, long; in ♀ flagellar joints cylindrical, sessile, the basal ones not quite twice as long as broad, verticillate-pilose. Front densely covered with whitish or pale yellowish scales. Hypostoma and palpi pale brownish or brownish-yellowish with minute white hairs. Thorax black or dark brown, opaque, with two dense longitudinal rows of golden-yellow hairs from humeri to scutellum; also lateral borders with golden-yellow hairs; pleuræ and pectus deep brown; scutellum and metanotum reddish ferruginous-brown, the former with yellow hairs; origin of wings reddish or ferruginous-brown; a small patch of white scales anterior to the origin of the wings. Halteres ochraceous, reddish or ferruginous, the club microscopically pubescent. Abdomen in the ♂ ochraceous, in the ♀ reddish or ferruginous; superior segments densely covered with black or dark brown scales, the posterior margins of segments sparingly beset with white hairs, and venter with white squamose pubescence; genitals ochraceous or brownish-ochreous, covered above with dark scales and white pubescence. Legs slender. Coxæ brownish or brownish-ochreous, with white pubescence. Femora pale yellow or ochreous at base, clothed with white scales, with black scales above and at the apex. Tibiæ and tarsi covered with

black scales ; hoary reflections. Wings broad, hyaline, with a dense blackish pubescence ; membrane, especially in the ♂, with dull reflection ; veins dark. Costal and first longitudinal vein with black scales and pubescence ; cross-vein extremely indistinct ; first longitudinal vein visible for the whole of its length ; second longitudinal vein straight, reaching the margin considerably before the apex of the wing ; third longitudinal reaching posterior margin opposite or immediately beyond tip of first longitudinal vein, its anterior branch nearly straight and very pale. (Description drawn from fresh specimens).

Hab.—Sydney (Skuse). Bred from bunches of brown, woody, cylindrical galls formed on the flower-stalks of *Acacia longifolia*. The full-grown galls are usually from 12 to 18 mm. long, and occur in bunches of from two to twenty or thirty tubes ; these tubes are rarely straight, being usually coalescent at the base and bending in an outward direction for their apical half. They are slightly constricted at the mouth, and clothed inside with a white pubescence which evidently serves to facilitate the egress of the pupa (Pl. xvi., figs. 1-1b).

There are two broods in the year ; the galls of the first brood are full-grown in August ; the second, which first appear in September, are full-grown in December or the beginning of January. A white cocoon is formed at the bottom of the tubes, and after the emergence of the perfect insect the pupa-case is left projecting from the orifice.

c. *Flagellar joints of the antennæ sessile in ♂ and ♀.*

433. *CECIDOMYIA NUBILIPENNIS*, sp.n.

♂.—	Length of antennæ.....	0·047 inch	...	1·18 millimètres.
	Expanse of wings.....	0·085 × 0·035	...	2·14 × 0·88
	Size of body.....	0·100 × 0·120	...	2·54 × 0·50

Antennæ half the length of entire body, 2- + 11-jointed, black ; flagellar joints cylindrical, sessile, shorter towards the end, the

terminal two sub-globose, the last with a very minute nipple-shaped process; verticils short. Front black or deep brown with yellow hairs. Face dull yellow. Palpi dark brown. Thorax black, dull, with two longitudinal rows of yellow hairs; lateral borders with yellow hairs; pleuræ deep brown; scutellum yellowish-brown, with yellow hairs; origin of wings ochreous or yellowish-brown. Halteres black, reddish at base, the club yellow. Abdomen reddish, all the segments with a broad band of black scales, and a small patch of white scales at the sides. Legs short and robust, black, the coxæ with white hairs. Wings rounded, densely covered with black hairs, the latter more dense at the apex and forming a conspicuous black patch over the posterior branch of the third longitudinal vein; also the anterior branch densely covered with the hairs; violaceous reflection; veins black or deep brown. Costal and first longitudinal veins very densely clothed with black hairs, the latter vein joining at about middle the length of wing; second longitudinal vein nearly straight, a little bent posteriorly at the tip, joining the margin at the apex of the wing; third longitudinal vein turning abruptly to the posterior margin, hidden by the black hairs. (Description drawn from fresh specimen).

Hab. - Elizabeth Bay, near Sydney (Skuse). October. A single specimen taken on a window.

Obs. - Very distinct from any other described species known to me, and easily recognized by the black cloud over the posterior branch of the third longitudinal vein.

Sub-genus *DIPLOSI*, Loew.

Diplosis, Loew, l.c., p. 68.

A. Second longitudinal vein reaching the margin of the wing at or before the apex.

1. Flagellar joints of the antennæ in the ♂ alternately single and double. (All ♀'s with unspotted wings, the ♂'s not being known, are located provisionally in this group).

434. DIPLOSIS FRENELÆ, sp.n. (Pl. xvi., fig. 2).

♀.—Length of antennæ..	...	0·025 inch	...	0·62 millimètre.
Expanse of wings.....	0·065 × 0·026	...	1·66 × 0·64	
Size of body.....	0·080 × 0·013	...	2·02 × 0·32	

Antennæ pale greyish, joints sub-cylindrical, twice as long as broad, with very short verticils. Front dark brown. Hypostoma and palpi sordid-ochreous or brownish. Thorax dark brown, with two longitudinal rows of yellow hairs, pleuræ, collare, scutellum, metathorax and an oblong patch next to scutellum, between the longitudinal rows of hairs, reddish-fulvous. Halteres red, the base of stem yellowish. Abdomen red, the terminal segment more yellowish, with pale hairs. Legs rather short, yellowish-grey. Wings hyaline, covered with a yellowish or brownish-yellow pubescence; veins pale; weak silvery reflections. Second longitudinal vein reaching the margin at the tip of the wing; cross-vein indistinct; third longitudinal vein very pale and indistinct, straight before the fork, the anterior branch twice the length of the posterior, slightly arcuated. (Description drawn from fresh specimen).

Hab.—Wagga Wagga district, N.S.W. (Skuse). Bred from sub-globular, brown, smooth, valvate, fruit-like galls, about 5 mm. in diameter, consisting of three thin valves with a median carinated line; found growing on the branchlets of the Desert pine (*Frenela Endlicheri*), in November (Pl. xvi., fig. 2). Each capsule contains only a single larva. It is not known whether the larva undergoes its transformation within the gall, or drops to the ground on the splitting of the valves; the latter is probably the case.

22. DIPLOSIS CÆCA, Sk.

D. cæca, Sk., l.c., p. 76.

Five old specimens recently found in the collection of the late Mr. W. S. Macleay belong to this species, and are labelled "*Cecidomyia muscorum*; on dead insects, N.S.W." I know nothing of this habit from personal observation.

B. SECOND LONGITUDINAL VEIN REACHING THE MARGIN OF THE WING BEYOND THE APEX.

1. Hair-whorls of the flagellar joints in the ♂ equally long on the upper and under sides. (All ♀'s with unspotted wings, the ♂'s not being known, are located provisionally in this group).

a. Wings unspotted.

28. DIPLOSIS ADUSTA, Sk.

D. adusta, Sk., l.c., p. 82.

♂.—Length of antennæ.....	0·100 inch	...	2·54 millimètres.
Expanse of wings.....	0·100 × 0·040	...	2·54 × 1·01
Size of body	0·060 × 0·015	...	1·54 × 0·38

The ♀ only was described originally, though in mistake stated to be ♂ at the head of the description. The ♂ antennæ are brown; flagellar joints globose, the alternate joints not noticeably larger than the intermediate ones; alternate pedicels slightly shorter than the intermediate ones; verticillate hairs moderately long and dense, brownish; terminal joint with a slender projection. (Description drawn from dried specimens).

Hab.—Sydney (Froggatt). September.

29. DIPLOSIS ARANEOSA, Sk.

D. araneosa, Sk., l.c. p. 82.

Similarly to the last, the type is erroneously stated to be a ♀. The ♂ only is at present known.

435. DIPLOSIS ALBULIPENNIS, sp.n.

♂.—Length of antennæ.....	0·125 inch	...	3·16 millimètres.
Expanse of wings.....	0·105 × 0·045	...	2·67 × 1·13
Size of body.....	0·105 × 0·020	...	2·67 × 0·50
♀.—Length of antennæ.....	0·075 inch	...	1·89 millimètres.
Expanse of wings.....	0·120 × 0·045	...	3·04 × 1·13
Size of body.....	0·105 × 0·020	...	2·67 × 0·50

♂ and ♀. Antennæ brown, the basal joints ochreous-yellow; verticils short, moderately dense, yellow; terminal joint with a slender projection; ♂ alternate joints twice the length of intermediate, the basal half narrower, the intermediate ones globose; pedicels, except towards the base, longer than the small joints; ♀ subcylindrical, constricted below the middle, rather long, more than twice the length of the pedicels. Front brown or brownish. Hypostoma brownish or brownish-ochreous. Palpi ochreous-yellow. Thorax brown or brownish, levigate, with two paler convergent lines from collare to scutellum, beset with golden-yellow hairs; pleuræ, scutellum, and metanotum ochreous-yellow, sometimes more brownish. Halteres ochreous-yellow. Abdomen ochreous or brownish-ochreous, clothed with yellow hairs. Legs long and slender, ochreous or brownish-ochreous, densely pubescent. Wings pellucid, with a slightly bluish tint, covered with a pale pubescence which imparts to them a whitish appearance; veins brown; rather weak margaritaceous reflections. First longitudinal vein distinct, gradually running into the costa, joining opposite or somewhat beyond the base of the fork of the third vein; cross-vein indistinct, situated about middle of first longitudinal; second longitudinal considerably arcuated, reaching margin beyond the apex of wing; branches of the third longitudinal pale and indistinct. (Description drawn from dried specimens).

Hab.—Sydney (Skuse); Dunoon, Richmond River, N.S.W. (Helms); Burpengary, near Brisbane, Queensland (Dr. T. L. Bancroft), *one specimen in Coll. Queensland Museum*. February to April.

Obs.—Evidently approaching *D. adusta*, Sk., or *D. araneosa*, Sk.

436. DIPLOSIS HELMSI, sp.n.

♂.—Length of antennæ.....	0·080 inch	..	2·02 millimètres.
Expanse of wings.....	0·055 × 0·025	...	1·39 × 0·62
Size of body.....	0·040 × 0·010	...	1·01 × 0·25
♀.—Length of antennæ	0·030 inch	...	0·76 millimètre.
Expanse of wings.....	0·057 × 0·025	...	1·44 × 0·62
Size of body.....	0·045 × 0·010	...	1·13 × 0·25

♂ Antennæ greyish ; alternate joints less than twice the length of the intermediate globose ones ; pedicels twice the length of the smaller joint towards tip of antennæ ; verticillate hairs pale, some scale-like, rather short, dense ; ♀ antennæ brown ; joints cylindrical, with very short pedicels ; verticils short, yellowish ; ♂ and ♀ terminal joint with a slender projection. Front, hypostoma, and palpi brown or brownish. Thorax yellow, sometimes very pale, sometimes more brownish, levigate, with yellowish hairs. Halteres pale yellow. Abdomen brown, sometimes deep brown, sometimes lighter or more yellowish-brown, densely haired ; genitalia yellow. Legs long and slender. Coxæ usually pale yellow. Remaining joints brown or brownish, the tip of the tibiæ, base of third tarsal and whole of two following joints yellow. Wings of about same size and shape in both sexes, pellucid, with a very faint brownish tint, densely covered with a very short pale pubescence ; silvery reflection ; veins pale ochreous. Costal very distinct ; cross-vein not distinguishable ; second longitudinal vein reaching the margin beyond the apex of wing ; third longitudinal straight until it forks, the branches indistinct. (Description drawn from dried specimens).

Hab.—Dunoon, Richmond River, N.S.W. (Helms). Twenty-two specimens in March and April.

Obs.—Probably comes nearest to *D. sulfurea*, Sk., but very distinct from any species hitherto described from Australia.

35. *DIPLOSIS PARILIS*, Sk. (Pl. xvi., fig. 3).

D. parilis, Sk., l.c., p. 87.

Bred from irregular-oval, reddish-brown blisters, 3 to 4 mm. long, having an ochreous-yellow or pale brownish slit (1 to 1½ mm. in length) in the middle ; occurring very numerously on the upper side of the leaves of *Eucalyptus corymbosa*, obtained by Mr. Froggatt, in November, at Waverley, near Sydney. The blisters extend through the leaf, being represented on the under side by very slightly raised brown patches. As many as forty or fifty blisters sometimes occur in one leaf ; they are usually dispersed over the surface, but occasionally form clusters of three

or four. It appears that the larvæ abandon the blisters before assuming their next state; the presence of the longitudinal opening also supports this conclusion.

The ♀ only has been described; and although several specimens of this insect were bred there was not a ♂ among them.

437. *DIPLOSIS EUCALYPTI*, sp.n. (Pl. xvi., fig. 4).

♀.—Length of antennæ	0·040 inch	...	1·01 millimètres.
Expansé of wings.....	0·080 × 0·013	...	2·02 × 0·32
Size of body.....	0·070 × 0·025	...	1·77 × 0·62

Antennæ half the length of the wings; joints of scapus greyish-ochreous; flagellar joint cinereous, cylindrical, with very short pedicels; the terminal joint with a minute projection. Front, hypostoma and palpi greyish-ochreous. Thorax brown above, sub-levigate, with two convergent pale ochreous lines to the scutellum; pectus tinged with brownish; pleuræ, scutellum and metanotum ochreous. Halteres ochreous, paler yellow at base of stem, with yellowish pubescence. Abdomen ochreous or brownish-ochreous, densely clothed with yellowish hairs; ovipositor yellow. Legs brown, the femora beneath and at tip, tibiæ at tip, and the last three joints of tarsi, pale yellow. Wings hyaline, densely covered with brownish pubescence; rather deeply ciliated; veins brownish; brassy reflections. Costal vein tolerably strong; first longitudinal vein joining opposite base of fork; cross-vein extremely indistinct; second longitudinal distinct, gently arcuated, reaching the margin beyond the apex of the wing; third longitudinal pale, turning abruptly towards the border, the anterior branch very pale, nearly three times the length of posterior. (Description drawn from fresh specimen).

Hab.—Botany, N.S.W. (Froggatt and Skuse). Bred from woody swellings on the stems of *Eucalyptus hæmastoma* in December.

Obs.—This species most resembles *D. conspecta*, Sk.

42. *DIPLOSIS MOLLIPES*, Sk.

D. mollipes, Sk., l.c., p. 92.

Mr. Helms obtained specimens of this species at Dunoon, Richmond River, N.S.W., in March and April.

2. Antennæ in the ♂ decorated with long hairs on the upper side.

52. *DIPLOSIS VIOLACEA*, Sk.

D. violacea, Sk., l.c., p. 101.

I have found this species in large numbers about Sydney in the months December to April. Mr. Helms obtained specimens at Dunoon, Richmond River, N.S.W., in April.

55. *DIPLOSIS NEGOTIOSA*, Sk.

D. negotiosa, Sk., l.c., p. 104; *D. fallax*, Sk., (♀), l.c., p. 85.

After comparing numerous additional specimens *D. fallax* is considered identical with *D. negotiosa*. This appears to be one of our commonest species.

56. *DIPLOSIS ACTIOSA*, Sk.

D. actiosa, Sk., l.c., p. 105.

Some specimens, darker coloured than those from which this species was originally described, were obtained by me at the Quarantine Grounds, North Head, near Sydney, in September.

Sub-genus *ASPHONDYLIA*, Loew.

Asphondylia, Loew, l.c., p. 108.

60. *ASPHONDYLIA LOEWI*, Sk.

A. Loewi, Sk., l.c., p. 108.

♂.—Length of antennæ.....	0·105 inch	...	2·67 millimètres.
Expanse of wings.....	0·120 × 0·055	...	3·04 × 1·39
Size of body.....	0·110 × 0·025	...	2·79 × 0·62

This species was described from a single ♀ specimen; another specimen recently obtained appears to be a ♂, and conforms with my description in everything but the size. The antennæ are 2- + 12-jointed, nearly as long as the entire body.

Hab.—Waverley, near Sydney, N.S.W. (Froggatt). One specimen in September.

Sub-genus *HORMOMYIA*, Loew.*Hormomyia*, Loew, l.c., p. 110.438. *HORMOMYIA OMALANTHI*, sp.n. (Pl. xvi., fig. 5).

♀.—Length of antennæ.....	0·070 inch	...	1·77 millimètres.
Expanse of wings	0·120 × 0·050	...	3·04 × 1·27
Size of body..	0·135 × 0·030	...	3·42 × 0·76

Antennæ longer than the head and thorax combined, brown, with a short blackish pubescence, 2- + 12-jointed; basal joints small; the flagellar joints cylindrical to sub-cylindrical, progressively diminishing in length and thickness, the terminal ones almost elliptical. Head black or deep brown. Palpi dusky. Thorax gibbose, entirely deep brown or black, shining, with two longitudinal rows of black hairs, also some black hairs on the sides. Halteres brown, with black pubescence. Abdomen deep brown, covered with black scales and hairs. Legs moderately long and slender, brown, covered with a black pubescence. Wings hyaline, with a blackish pubescence; veins brown; opaline reflections. Costal veins with a black pubescence; first longitudinal vein wide of the costa, running obliquely into it, before the middle of the wing; second longitudinal strong, somewhat arcuated towards the tip, meeting tip of costa a little beyond the apex of wing; third longitudinal vein distinct, the branches pale; fork large, the anterior branch rather more than twice the length of the posterior. (Description drawn from dried specimen).

Hab.—Mount Kembla, Illawarra District, N.S.W. (Skuse). Bred from dark brown, woody, smooth, somewhat shining, globular, hollow galls, 5 mm. in diameter, found in clusters along the midrib on the underside of the leaves and in dense masses around the stems of *Omalthus populifolius*; obtained in the month of November. The galls were ripe when collected, and the imago emerged a few days after. The larva does not construct a cocoon, and on the emergence of the imago the pupa-case is left hanging to the gall.

Sub-genus EPIDOSIS, Loew.

Epidosis, Loew, l.c. p. 115.

439. EPIDOSIS GRANDIPENNIS, sp.n.

♂.—Length of antennæ.....	0.150 inch	...	3.81 millimètres.
Expanse of wings.....	0.190 × 0.060	...	4.81 × 1.54
Size of body..	0.135 × 0.020	...	3.42 × 0.50

Antennæ brown, 2- + 13-jointed; joints sub-elliptical, with long verticils; pedicels long, once and a half to twice the length of the joints. Hypostoma, front, and palpi brown. Thorax dark brown, nearly black, shining, with two rows of brown hairs; pleura tinged with ochreous-yellow, especially at origin of wings; metanotum somewhat tinged with ochreous-yellow; pectus and scutellum dark brown. Halteres brownish, whitish at apex of club, densely covered with minute hairs. Abdomen slender, dark brown, opaque, clothed with yellowish hairs. Legs extremely long and slender (the hind pair measuring 9 mm. in length), brown, the terminal joints of tarsi paler; densely clothed with short hairs. Wings long, proportionately broad, hyaline, densely covered with brownish pubescence; veins brown, the anterior branch of the third vein pale; bronzy and roseous reflections. First longitudinal vein wide of the costa, joining it opposite base of fork of third vein; cross-vein distinct for the whole of its length; second longitudinal vein hardly sinuose before the cross-vein, considerably arcuated towards the apex, reaching the margin beyond the apex of the wing; third longitudinal running almost parallel with posterior margin, turning abruptly to the margin; anterior branch gently arcuated. (Description drawn from dried specimen).

Hab.—Mossman's Bay, near Sydney (Skuse). One specimen in September.

Obs.—Allied to *E. distenta*, Sk.

66. EPIDOSIS DISTENTA, Sk.

E. distenta, Sk., l.c., p. 115.

Mr. Helms obtained a few ♀ specimens at Dunoon, Richmond River, N.S.W., in March and April.

Genus SPANIOCERA, Winnertz.

Spaniocera, Winn., l.c., p. 126.

440. SPANIOCERA AUSTRALIS, sp.n.

♂.—Length of antennæ.....	— inch	...	— millimètres.
Expanse of wings.....	0·052 × 0·022	...	1·32 × 0·55
Size of body.....	0·040 × 0·008	...	1·01 × 0·20

Antennæ yellowish-brown, the flagellar joints (mostly lost in the specimen before me) long, cylindrical, with a microscopic pubescence. Head dark brown, somewhat shining; palpi yellowish. Thorax dark brown, somewhat shining; pleuræ and metathorax tinged with obscure fulvous. Halteres white, the stem with microscopic brown scales. Abdomen covered with minute dark brown scales; ♂ forceps sordid yellowish. Legs moderately long, very slender, sordid whitish, clothed with minute scales. Wings hyaline, densely covered with minute, brown, scaly hairs. Venation similar to that figured by Winnertz (Linn. Entom. VIII. pl. iv. fig. 8, 1853), but the third vein disappears considerably before the wing-margin. (Description drawn from dried specimen).

Hab.—Hogan's Brush, Narara Creek, near Gosford, N.S.W. (Skuse). One specimen in August, in dense bush.

Obs.—This genus has hitherto been only known by one or two European species.

Genus LASIOPTERA, Meigen.

Lasioptera, Meig., l.c., p. 127.

*A. Wings without a white spot on the middle of the anterior border.*441. *LASIOPTERA VIRGATA*, sp.n.

♂.—Length of antennæ.....	0·020 inch	...	0·50 millimètre
Expansé of wings.....	0·090 × 0·030	...	2·27 × 0·76
Size of body.....	0·090 × 0·015	...	2·27 × 0·38
♀.—Length of antennæ.....	0·030 inch	...	0·76 millimètre.
Expansé of wings.....	0·085 × 0·040	...	2·14 × 1·01
Size of body	0·095 × 0·020	...	2·39 × 0·50

Antennæ in the ♂ rather shorter, in the ♀ 2- + 20-jointed, rather longer than the thorax; joints of the scapus brown, with niveous scales; flagellar joints black, sessile, sub-elliptical, with tolerably long, sparse, verticils. Head covered with yellow scales. Eyes contiguous on the front. Facies and palpi covered with niveous scales. Thorax adorned with yellow scales, with two longitudinal rows of long yellow hairs, and yellow hairs at the humeri and on the lateral borders; some niveous scales and hairs under the root of the wings; pleuræ deep brown; scutellum covered with yellow scales, and fringed with long hairs; metathorax deep brown. Halteres ochraceous or very pale brown, microscopically scaled. Abdomen in the ♂ as wide as the thorax and about three times its length, in the ♀ somewhat more robust; dorsal segments black or very deep olivaceous-brown, bordered posteriorly with a broad band of silvery scales; covered with white scales beneath; appearing pale brown where the scales are removed; ♂ forceps pale brown, scaly; ♀ ovipositor ochraceous, more than half the length of the abdomen. Legs long and slender, densely clothed with scales. Coxæ deep brown, with white scales and hairs; femora pale yellowish or whitish at the base, brownish for the apical half on the upper side; tibiæ brownish or dusky, sometimes ochraceous beneath; tarsi almost fuliginous, with weak greyish reflections in a certain light, the last two joints, and sometimes also the tip of the third joint white. Wings pale brown at the root, hyaline, with a weak cupreo-roseous reflection; pubescence

and marginal cilia appearing grey; no pubescence immediately under the second longitudinal vein for almost the whole of its length. Costal vein covered with deep brown scales and hairs; first longitudinal not discernible; second longitudinal yellowish; third longitudinal very pale, the interior branch scarcely visible but for the wing-fold. (Description drawn from fresh specimens).

Hab.—Elizabeth Bay (Skuse). November.

442. LASIOPTERA WILDI, sp.n.

♂.—Length of antennæ.....	0·020 inch	...	0·50 millimètre.
Expansé of wings.....	0·075 × 0·030	...	1·89 × 0·76
Size of body.....	0·070 × 0·013	...	1·77 × 0·32
♀.—Length of antennæ.....	0·022 inch	...	0·55 millimètre.
Expansé of wings.....	0·075 × 0·030	...	1·89 × 0·76
Size of body.....	0·070 × 0·013	...	1·77 × 0·32

Antennæ black, joints of scapus usually brownish-ochreous, in ♂ 2 + 13- or 2- + 14, in ♀ 2- + 16-jointed; joints sessile, sub-globular, progressively diminishing in size. Palpi yellowish or brownish-yellow. Front with golden-yellow scales. Thorax covered with golden-yellow scales, principally arranged in two double longitudinal rows; pleuræ and scutellum brown, with some white scales; metanotum brown; some long yellow hairs laterally about the base of wings. Halteres yellow. Abdomen covered superiorly on each segment with black scales, each segment bordered posteriorly with two lateral patches of white or pale yellowish scales; venter yellowish, with white scales; ♂ forceps with white hairs; ♀ ovipositor ochreous. Coxæ, femora, and tibiæ ochreous-yellow, the latter bordered anteriorly with brown; tarsi brown, with pale reflections when viewed at a certain obliquity. Wings yellow at the root, hyaline, with blue and violaceous reflections; brownish pubescence. Costal vein brown, densely scaled; first longitudinal yellow, joining some distance beyond the middle of the wing; third longitudinal vein very pale. (Description drawn from dried specimens).

Hab.—Botanical Gardens, Brisbane, Q. (C. J. Wild). *March.*
Specimens in Coll. Queensland Museum.

Obs.—This species should probably be classified between *L. corusca*, Sk., and *L. helvipes*, Sk.

83. LASIOPTERA MISCELLIA, Sk. (Pl. xvi., fig. 6)

L. miscella, Sk., l.c., p. 131.

♂.—Length of antennæ.....	0·035 inch	...	0·88 millimètre.
Expanse of wings.....	0·065 × 0·030	...	1·66 × 0·76
Size of body.....	0·060 × 0·015	...	1·54 × 0·38

The ♀ only has been described. ♂ antennæ 2- + 23- or 2- + 24-jointed. Halteres bright fulvous. Scutellum reddish-brown. Incisions between abdominal segments reddish; anal segment fulvous; forceps brown. Legs with white scales beneath. (Description drawn from fresh specimens).

Hab.—Botany (Froggatt and Skuse). Bred from malformed, coalescent leaf-stalks of *Eucalyptus hæmastoma*, in November.

Sub-family II. LESTREMINA.

Genus CAMPYLOMYZA, Meigen.

Campylomyza, Meig., l.c., p. 133.

b. Wings rounded at the base.

443. CAMPYLOMYZA GRANDIUSCULA, sp.n.

♂.—Length of antennæ.....	0·045 inch	...	1·13 millimètres.
Expanse of wings.....	0·075 × 0·033	...	1·89 × 0·84
Size of body.....	0·060 × 0·013	...	1·54 × 0·32

Antennæ more than $\frac{2}{3}$ the length of entire body, 2- + 12-jointed, dark brown; flagellar joints globose or oval, with rather long yellowish verticillate hairs; pedicels as long as the joints. Palpi brown. Front blackish. Thorax deep brown, levigate, with two converging rows of golden-yellow hairs; also the borders with some golden-yellow hairs; pleuræ and pectus dark brown; scu-

tellum yellowish-brown. Halteres brownish. Abdomen deep brown, clothed with yellow hairs. Legs slender, moderately long, greyish-brown with yellowish reflection. Wings almost hyaline, densely covered with short brownish hairs; no scales or scaly hairs; veins brown; cupreous reflections. First longitudinal vein wide of the costa, joining beyond half the length of the wing; second longitudinal arcuated beyond the cross-vein, reaching the margin immediately below the apex of the wing; cross-vein distinct, situated somewhat before midway between origin of third longitudinal vein and tip of first longitudinal. (Description drawn from dried specimen).

Hab.—Sydney (Skuse). August.

Obs.—This it at once easily distinguished from the other Australian species by its much larger size; and belongs to that section of the genus in which the wings have a prominently rounded base. Nearly twice the size of *C. amplipennis*, Sk.

Genus LESTREMIA, Macquart.

Lestremia, Macq., l.c. p. 144.

444. LESTREMIA SYDNEYENSIS, sp.n.

♀.—Length of antennæ.....	0·020 inch	...	0·50 millimètre.
Expanse of wings.....	0·085 × 0·033	...	2·14 × 0·84
Size of body.....	0·070 × 0·013	...	1·77 × 0·32

Antennæ the length of the head and thorax taken together, 2+10-jointed, sooty or dark brown, with short verticillate hairs. Front and hypostoma dark brown or black. Palpi brown. Thorax dark brown, opaque, with two rows of golden-yellow hairs; humeri, base of wings, and scutellum ochreous-yellow, the latter with golden-yellow hairs. Halteres yellow, the club somewhat brownish. Abdomen umber brown, darker on the superior segments, clothed with yellow hairs; terminal lamellæ ovate. Legs very slender, the hind pair considerably longer than the others; greyish-brown, densely covered with a minute pubescence. Wings with the posterior angle and apex rounded, hyaline,

densely covered with extremely microscopic pubescence intermixed with very short (but much longer) hairs; costa, first and second longitudinal veins and cross-vein brown, distinct, the rest pale; rich cupreous reflections. First longitudinal vein joining costa before the middle and a little beyond the cross-vein; cross-vein obliquely situated; second longitudinal uniting with the tip of costa opposite the middle of the fork; the fork rather more than twice the length of the petiole, its anterior branch reaching the margin immediately below the apex of the wing; fourth longitudinal vein branching at the base of wing.

Hab.—Sydney (J. D. Ogilby). One specimen in June.

Obs.—This is the first species of *Lestremia* described from Australia. The venation is similar to that figured by Winnertz (V. z-b. G. Wien, XX. 1870, pt. II. fig. 1).

Fam. SCIARIDÆ.

Genus SCIARA, Meigen.

Sciara, Meig., l.c., p. 672.

I. FIRST LONGITUDINAL VEIN JOINING THE COSTA OPPOSITE OR BEYOND THE BASE OF THE FORK.

A. Halteres black or brown, the stalk wholly or partly yellow, yellowish or whitish.

1. Palpi black or brown.

A. Cross-vein situated before the middle of the first longitudinal vein.

b. *Tip of the second longitudinal vein and tip of the posterior branch of the fork equally near the apex of the wing.*

445. SCIARA RECONDITA, sp.n.

♀.—Length of antennæ..... 0·057 inch ... 1·44 millimètres.
 Expanse of wings..... 0·125 × 0·045 ... 3·16 × 1·13
 Size of body..... 0·110 × 0·020 ... 2·79 × 0·50

Antennæ black or sooty-brown, slender, with a short pale pubescence; as long as head and thorax taken together; joints of scapus sparsely pubescent; flagellar joints sub-sessile, about 3 times as long as broad, progressively diminishing in thickness. Head black, sub-levigate. Eyes contiguous above. Palpi brown. Thorax black, sub-levigate, with three almost parallel rows of yellow hairs reaching to the scutellum; pleuræ and metanotum black; scutellum deep reddish-brown, with black hairs. Halteres reddish-brown. Abdomen black or very deep brown, clothed with short brown hairs; in the middle about as broad as thorax; lamellæ of the ovipositor black, elongate. Legs deep umber-brown, the tarsi black. In the fore- and intermediate-legs the tibiæ and tarsi of about equal length; in the hind-legs the tibiæ a little longer than the tarsi. Spurs very short. First joint of the tarsi twice the length of the second; second a little longer than third, about equal to fourth and fifth combined; the last two about equal in length. Wings pellucid, with a greyish-brown tint, the costa and first two longitudinal veins deep brown; margaritaceous reflections. First longitudinal vein reaching the costa exactly opposite the base of the fork; cross-vein distinct, situated immediately before the middle of the first longitudinal; petiole much paler than the fork, about the length of the posterior branch; branches parallel; tip of the anterior one scarcely divergent. *fg* twice and half the length of *gh*; *kl* somewhat shorter than *lm*.

Hab.—Mossman's Bay, near Sydney (Skuse). September.

Obs.—Follows *S. Macleayi*, Sk., in the classification.

B. Cross-vein situated at the middle of the first longitudinal vein.

a. Tip of the second longitudinal vein nearer the apex of the wing than the tip of posterior branch of the fork.

446. *SCIARA TRYONI*, sp.n.

♂.—Length of antennæ..... 0·120 inch ... 3·04 millimètres.
 Expanse of wings..... 0·160 × 0·060 ... 4·06 × 1·54
 Size of body..... 0·130 × 0·030 ... 3·30 × 0·76

♀.—Length of antennæ... ..	0·085 inch	... ..	2·14 millimètres.
Expanse of wings.....	0·200 × 0·070	... ..	5·08 × 1·77
Size of body.....	0·210 × 0·035	... ..	5·33 × 0·88

♂.—Antennæ rather slender, nearly as long as entire body, brown, with dense, pale yellow pubescence; joints of scapus fulvous or brownish-fulvous, with a few short brown hairs; flagellar joints 3 to 5 or 6 times as long as broad, subsessile, progressively diminishing in thickness. Head black. Eyes contiguous above. Palpi brown. Thorax brownish-fulvous, sub-nitidous, with two scarcely noticeable sparse rows of very short brown hairs; scutellum with some distinct brown hairs; pectus rather paler fulvous than the rest of the thorax. Halteres black, the base of stem fulvous. Abdomen deep brown or black, somewhat shining, densely clothed with moderately long black hairs; terminal segment and forceps yellowish-brown, with black hairs. Coxæ fulvous. Fore and intermediate femora fulvous; the hind pair brown or black, usually somewhat paler at the base. Tibiæ and tarsi black. In the fore-legs the tarsi about $\frac{1}{2}$ longer than the tibiæ; in the intermediate-legs the tibiæ and tarsi of about equal length; in the hind-legs the tibiæ $\frac{1}{2}$ longer than the tarsi. Spurs brown or yellowish-brown, about the length of last joint of tarsi. First joint of tarsi $2\frac{1}{2}$ to 3 times the length of the second; second about $\frac{2}{3}$ longer than third, and equal to fourth and fifth together. Wings pellucid, with a pale greyish-brown tint, more brownish between second longitudinal and costa; veins dark brown; opaline reflections. First longitudinal vein reaching costa a little beyond the base of the fork; cross vein distinct, situated at the middle of the first longitudinal vein; petiole much paler than the fork, somewhat longer than posterior branch; posterior branch shorter than the anterior, both slightly divergent at the tips. *fg* about $2\frac{1}{2}$ times the length of *gh*; *kl* about $\frac{3}{4}$ the length of *lm*.

♀.—Antennæ slender, a little longer than the head and thorax taken together, the pubescence shorter than in the ♂; flagellar joints $2\frac{1}{2}$ to 4 times as long as broad, the terminal joint longer. Lamellæ of the ovipositor ovate, black. Wings distinctly darker

than in the ♂, considerably darker between second longitudinal and costa. *fg* twice the length of *gh*; *kl* about $\frac{1}{2}$ the length of *lm*.

Hab.—Brisbane (H. Tryon and F. Allbon), Hamilton, Upper Nth. Pine, Queensland (C. J. Wild); *several specimens in Coll. Queensland Museum.* January to March.

Obs.—Very distinct from any other species known to me.

C. Cross-vein situated beyond the middle of the first longitudinal vein.

b. *Tip of the second longitudinal vein and the tip of the posterior branch of the fork equally near the apex of the wing.*

447. SCIARA TEPPERI, sp.n.

♀.—Length of antennæ..... 0·070 inch ... 1·77 millimètres.

Expanse of wings..... 0·175 × 0·060 ... 4·43 × 1·54

Size of body..... 0·150 × 0·027 ... 3·81 × 0·68

Antennæ as long as the head and thorax taken together, black, covered with pale yellowish-grey pubescence; joints of the scapus sparingly haired; flagellar joints sessile, 2 to $2\frac{1}{2}$ times as long as broad, progressively diminishing in thickness. Head black or deep brown, sub-levigate. Eyes contiguous above. Palpi deep brown or black. Thorax black, levigate, with two longitudinal, convergent rows of short brown hairs to the scutellum: some longer black hairs laterally; humeri very slightly tinged with yellowish-brown. Halteres black or deep brown, the stem more or less yellowish-brown. Abdomen dusky reddish-brown, the terminal segments and lamellæ black or nearly so; lamellæ of ovipositor oval. Legs deep umber-brown, the tarsi more dusky. In the fore- and intermediate-legs the tibiæ and tarsi of about equal length; in the hind-legs the tibiæ not quite $\frac{1}{4}$ longer than the tarsi. Spurs honey-yellow. First joint of the tarsi $2\frac{1}{2}$ times the length of the second; second joint $\frac{1}{2}$ longer than third, and equal to fourth and fifth combined; fifth rather longer than fourth. Wings yellowish-brown at the root, pellucid, with a pale greyish-brown tint; opaline reflections. Costal and first two longitudinal veins black. First longitudinal vein reaching costa

opposite the base of the fork; cross-vein distinct, situated beyond the middle of the first longitudinal; petiole almost as distinct as the fork, the length of the posterior branch; branches not divergent at the tips; both arcuated at the base. *fg* three times the length of *gh*; *kl* slightly shorter than *lm*.

Hab.—Mount Lofty, near Adelaide, South Australia (J. G. O. Tepper); two specimens in Coll. Adelaide Museum. October and November.

448. *SCIARA PROMISCUA*, sp.n.

♀.—Length of antennæ.....	0·053 inch	...	1·27 millimètres.
Expanse of wings.....	0·150 × 0·055	...	3·81 × 1·39
Size of body.....	0·155 × 0·025	...	3·93 × 0·62

Antennæ slender, rather longer than head and thorax combined; black or deep brown, densely covered with short pale yellowish pubescence; joints of the scapus deep brown, sparingly pubescent; flagellar joints sub-sessile, 2 to $2\frac{1}{2}$ times as long as broad, the terminal joint slender. Head black, almost opaque. Eyes contiguous above. Palpi deep brown. Thorax black, sub-levigate, with two longitudinal, convergent rows of tolerably long black hairs to the scutellum; lateral borders and scutellum also with moderately long black hairs; humeri very slightly tipped with yellowish-brown. Halteres black or very dark brown, yellowish towards base of stem. Abdomen very deep reddish-brown, the posterior segments black; clothed with very short brown hairs; lamellæ of the ovipositor black, oval. Legs pitch brown, the tip of first and the following joints of tarsi black. In fore- and intermediate-legs the tibiæ somewhat longer than the tarsi; in the hind-legs the tibiæ $\frac{1}{2}$ longer than the tarsi. Spurs honey-yellow, the length of fourth tarsal joint. First joint of the tarsi $2\frac{1}{2}$ times the length of the second; second joint $\frac{1}{2}$ longer than the third, and equal to fourth and fifth taken together; fifth joint rather longer than the fourth. Wings pellucid, greyish-brown; the costal and first two longitudinal veins brown; margaritaceous reflections. First longitudinal vein joining opposite or slightly beyond the base of the fork; cross-vein distinct, situated somewhat

beyond the middle of the first longitudinal vein; petiole paler than the fork, shorter than the posterior branch; branches slightly divergent at their tips. *fg* about $4\frac{1}{2}$ times the length of *gh*; *kl* three-fourths the length of *lm*.

Hab.—Mount Kosciusko, N.S.W., 5000 ft. (Helms); *two specimens in Coll. Australian Museum.* March.

II. FIRST LONGITUDINAL VEIN JOINING THE COSTA BEFORE THE BASE OF THE FORK.

A. Halteres black or brown, the stalk wholly or partly yellow, yellowish or whitish.

1. Palpi black or brown.

B. Cross-vein situated at the middle of the first longitudinal vein.

449. *SCIARA CONTERMINA*, sp.n.

♀.—Length of antennæ.....	0·065 inch	...	1·66 millimètres.
Expanse of wings.....	0·140 × 0·050	...	3·55 × 1·27
Size of body.....	0·135 × 0·025	...	3·42 × 0·62

Antennæ slender, longer than the head and thorax taken together, black or deep brown, with a short pale pubescence; joints of scapus black, sparingly pubescent; flagellar joints sessile, sub-sessile towards the tip, 2 to about $2\frac{1}{2}$ times as long as broad. Head black, almost opaque, with a greyish bloom. Eyes contiguous above. Palpi brown. Thorax black, levigate, with a slight greyish bloom; three almost parallel rows of short brown hairs, the intermediate one not quite reaching the scutellum; lateral borders and scutellum with tolerably long black hairs; humeri very slightly tipped with yellowish-brown. Halteres brown, the stem ochreous or brownish-ochreous. Abdomen dusky-brown, with short brown hairs; terminal segments and lamellæ of ovipositor blackish, the latter elongate-oval. Legs dusky-brown, the terminal joints of tarsi blackish. In the fore- and intermediate-legs the tibiæ and tarsi of about equal length; in the hind-legs the tibiæ a little longer than the tarsi. Spurs honey-yellow. First joint of the tarsi rather more than twice

the length of the second; second joint nearly $\frac{1}{2}$ longer than the third, and equal to the fourth and fifth combined. Wings pellucid, with a grey tint, the costal and first two longitudinal veins deep brown; margaritaceous reflections. First longitudinal vein reaching the costa a little before the base of the fork; cross-vein distinct, situated at the middle of the first longitudinal; tip of the second longitudinal vein and tip of the posterior branch of the fork equally near the apex of the wing; petiole paler than the fork, as long as the posterior branch; branches parallel, very slightly divergent at the extreme tips, the posterior branch less arcuated at the base than the anterior one. *fg* from $1\frac{1}{2}$ to $1\frac{1}{2}$ times the length of *gh*; *kl* about $\frac{1}{2}$ the length of *lm*.

Hab.—Mount Kosciusko, N.S.W., 5000 ft. (Helms); *two specimens in Coll. Australian Museum.* March.

Obs.—Closely resembling *S. finitima*, Sk., from which it may be distinguished by its longer antennæ, rather darker wings, &c.

C. Cross-vein situated beyond the middle of the first longitudinal vein.

a. *Tip of the second longitudinal vein nearer the apex of the wing than the tip of the posterior branch of the fork.*

† *Thorax with two longitudinal rows of hairs.*

450. *SCIARA FLAVICOXIS*, sp.n.

♀.—Length of antennæ.....	0·042 inch	...	1·06 millimètres.
Expanse of wings.....	0·100 × 0·037	...	2·54 × 0·90
Size of body.....	0·100 × 0·016	...	2·54 × 0·40

Antennæ black, slender, somewhat longer than the head and thorax combined; second joint of scapus brown; flagellar joints sub-sessile, all but terminal joint twice as long as broad, the latter slender. Head black, almost opaque. Eyes contiguous above. Palpi black. Thorax black, nitidous, with two longitudinal indistinct rows of black hairs, extending to the scutellum; lateral borders and scutellum with tolerably long black hairs. Halteres black, the stem yellow. Abdomen deep brown, paler beneath,

rather densely clothed with short brown hairs; ovipositor black, the terminal lamellæ very small, oval. Coxæ and femora yellow, the hind femora tinged with brownish. Tibiæ and tarsi brown, the terminal joints of the latter black. In the fore-legs the tibiæ and tarsi of about equal length; in the intermediate-legs the tibiæ about $\frac{1}{2}$ longer than the tarsi; (tarsi of hind legs lost). Spurs short, brown. First joint of the tarsi 3 times the length of the second; second about $\frac{1}{2}$ longer than third, and about equal to the fourth and fifth taken together; fifth joint somewhat longer than the fourth. Wings pellucid, almost hyaline, with brilliant, chiefly chalybeous, reflections; costal and first two longitudinal veins blackish-brown. First longitudinal vein reaching the costa a short distance before the base of the fork; petiole paler than the fork, as long as or scarcely longer than the posterior branch of the fork; branches not divergent, but parallel at the tips. *fg* not quite twice the length of *gh*; *kl* a little shorter than *lm*.

Hab.—Dunoon, Richmond River, N.S.W. (Helms). One specimen in April.

†† *Thorax with three longitudinal rows of hairs.*

451. *SCIARA EXPOSITA*, sp.n.

♀.—Length of antennæ.....	0·060 inch	...	1·54 millimètres.
Expanse of wings.....	0·140 × 0·050	...	3·55 × 1·27
Size of body.....	0·135 × 0·022	...	3·42 × 0·55

Antennæ black or deep brown; slender, about half the length of the body; flagellar joints sub-sessile, about twice as long as broad. Head black, almost opaque. Eyes contiguous above. Palpi black or deep brown. Thorax black, almost opaque, with a greyish bloom, and three longitudinal rows of extremely minute hairs, the intermediate one most indistinct and not reaching the scutellum; lateral borders and scutellum with minute hairs. Halteres entirely brown. Abdomen obscure fulvous, the terminal segments black, clothed with short brown hairs; in the middle as broad as the thorax; the lamellæ of the ovipositor black, oval. Legs deep umber-brown, the tarsi black. In the fore-legs the tarsi

about $\frac{1}{2}$ longer than the tibiae; in the intermediate-legs the tibiae and tarsi of equal length; in the hind-legs the tibiae about $\frac{1}{2}$ longer than the tarsi. Spurs short, brown. First joint of the tarsi 3 times the length of the second; second joint $\frac{1}{2}$ longer than the third and about the length of fourth and fifth taken together. Wings pellucid, with a pale greyish tint, darker between the second longitudinal and costal veins; costal and first two longitudinal veins deep brown; rich margaritaceous reflections. First longitudinal vein reaching the costa a short distance before the base of the fork; cross-vein distinct, situated beyond the middle of the first longitudinal vein; petiole quite as distinct as the fork, not $\frac{1}{2}$ the length of the posterior branch; branches considerably arcuated posteriorly, running almost parallel for the greater part of their length, the posterior one slightly divergent at the extreme tip. *fy* twice the length of *gh*; *kl* about $\frac{2}{3}$ the length of *lm*.

Hab — Berowra, Hawkesbury district, N. S. W. (Skuse) January.

452. *SCIARA ADJUNCTA*, sp.n.

♀.—Length of antennæ.....	0·040 inch	...	1·01 millimètres.
Expanse of wings.....	0·110 × 0·040	...	2·79 × 1·01
Size of body.....	0·100 × 0·016	...	2·54 × 0·40

Antennæ black, with a pale yellowish pubescence; slender, about as long as the head and thorax combined; joints of scapus with a sparse minute pubescence; flagellar joints sub-sessile, 2 to 3 times as long as broad, the terminal joint about $\frac{1}{2}$ longer than the one immediately preceding. Head black, almost opaque. Eyes contiguous above. Palpi black. Thorax black, almost opaque, with three longitudinal indistinct rows of very minute yellowish hairs, the intermediate row extending beyond the middle; scutellum with some moderately long black hairs. Halteres black, the stem yellowish. Abdomen deep sooty-black, not quite as black as thorax, clothed with very short hairs; lamellæ of the ovipositor black, oval. Coxæ brown, the fore and intermediate pairs tinged with ochreous on the apical half. Femora ochreous. Tibiæ brown. Tarsi black. In the fore and intermediate-legs

the tarsi a little longer than the tibiæ ; in the hind-legs the tibiæ very slightly longer than the tarsi. Spurs very short, honey-yellow. First joint of the tarsi in the fore- and intermediate-legs $2\frac{1}{2}$ times the length of the second, in the hind-legs very slightly more than 3 times the length ; second joint $\frac{1}{4}$ longer than the third, and equal to the fourth and fifth taken together ; the latter two of equal length. Wings pellucid, with a pale greyish tint and brilliant reflections ; the costal and first two longitudinal veins deep brown or blackish. First longitudinal vein joining costa a short distance before the base of the fork ; cross-vein distinct ; petiole paler than the fork, a little shorter than the posterior branch ; posterior branch very slightly bent at its base, nearly straight ; branches parallel, scarcely divergent at the extreme tips. *fg* somewhat longer than *gh* ; *kl* somewhat shorter than *lm*.

Hab.—Dunoon, Richmond River, N.S.W. (Helms). April.

Obs.—Closely related to *S. frequens*, Sk.

h. *Tip of the second longitudinal vein and tip of the posterior branch of the fork equally near the apex of the wing.*

† *Thorax with two longitudinal rows of hairs.*

453. SCIARA MARGINATA, sp.n.

♀.—Length of antennæ.....	0·060 inch	...	1·54 millimètres.
Expanse of wings.....	0·180 × 0·065	...	4·56 × 1·66
Size of body	0·160 × 0·035	...	4·06 × 0·88

Antennæ black, densely covered with a pale pubescence ; as long as the head and thorax combined ; joints of the scapus moderately haired ; flagellar joints sub-sessile, twice as long as broad, the terminal joints longer. Head black, levigate. Eyes almost contiguous above. Palpi black. Thorax black, sub-nitidous, with two longitudinal rows of short black hairs extending to the scutellum ; some long hairs on the lateral borders and scutellum. Halteres black, the base of stem dusky brown. Abdomen black, sub-levigate, densely clothed with short black hairs ; as broad as the thorax ; lamellæ of the ovipositor black

oval. Legs black, the coxæ and femora sometimes deep brown. In the fore-legs the tarsi a little longer than the tibiæ; in the intermediate-legs the tibiæ and tarsi of equal length; in the hind-legs the tibiæ a little longer than the tarsi. Tibial spurs brown. First joint of tarsi in the fore-legs slightly more than twice the length of the second; in the intermediate-legs $2\frac{1}{2}$, and in the hind-legs about three times its length; second joint about $\frac{1}{2}$ longer than the third, and equal to the fourth and fifth combined; fifth rather longer than the fourth. Wings pellucid, with a pale brownish tint, distinctly darker from immediately below the second longitudinal vein to costa; opaline reflections; costal and first two longitudinal veins black. First longitudinal vein reaching costa considerably before the base of the fork; petiole paler than the fork, as long or slightly longer than the anterior branch; extreme base of the fork as pale as the petiole, branches almost parallel, somewhat divergent towards the tips. *fg* from 5 to 6 times the length of *gh*; *kl* considerably longer than *lm*.

Hab.—North Shore, near Sydney (Helms). Five specimens in August.

Obs.—Considerably resembling *S. æmula*, Sk., from which it can however be readily distinguished by the venation of the wings.

454. *SCIARA INFIXA*, sp.n.

♀.—Length of antennæ	0·065 inch	...	1·66 millimètres.
Expanse of wings.....	0·155 × 0·050	...	3·93 × 1·27
Size of body.....	0·165 × 0·025	...	4·18 × 0·62

Antennæ dark brown, densely covered with pale yellow pubescence; slender, almost as long as the head and thorax combined; joints of scapus with tolerably long hairs; flagellar joints sub-sessile, rather more than twice as long as broad, the terminal joint longer. Head black, almost opaque. Eyes contiguous above. Palpi black. Thorax black, levigate, with a slight grey bloom; traversed by two very distinct longitudinal rows of rather long black hairs to scutellum; lateral borders and scutellum with some longer black hairs. Halteres black, the basal portion

of stem ochreous. Abdomen umber-brown, the terminal segments black, clothed with very short brown hairs; lamellæ of the ovipositor black, oval. Legs brown; the tip of first and the last four tarsal joints black. In the fore-legs the tibiæ and tarsi of equal length; in the intermediate-legs the tibiæ somewhat longer than the tarsi; in the hind-legs the tibiæ nearly $\frac{1}{2}$ longer than the tarsi. Spurs as long as the last joint of tarsi, honey-yellow. First joint of the tarsi in the fore- and intermediate-legs $2\frac{1}{2}$ times the length of the second, in the hind-legs about three times its length; second joint in the fore- and intermediate-legs slightly longer than the third, in the hind-legs $\frac{1}{2}$ longer; the length of the fourth and fifth taken together. Wings pellucid, with a pale greyish tint, and brilliant reflections; costal and first two longitudinal veins dark brown. First longitudinal vein joining costa a little before the base of the fork; cross-vein distinct; petiole paler than the fork, very slightly shorter than the posterior branch; branches very slightly divergent at the tips; the anterior branch $\frac{1}{8}$ longer than the posterior. *fg* three times the length of *gh*; *kl* considerably longer than *lm*.

Hab.—Mount Kosciusko, N.S.W., 5000 ft. (Helms); *in Coll. Australian Mus.* One specimen in March.

†† *Thorax with three longitudinal rows of hairs.*

455. *SCIARA CONSANGUINEA*, sp.n.

♀.—Length of antennæ.....	0·037 inch	...	0·90 millimètre.
Expanse of wings.....	0·108 × 0·042	..	2·73 × 1·06
Size of body.....	0·108 × 0·018	...	2·73 × 0·45

Antennæ dark brown or black, densely covered with a pale pubescence; very slender, as long as the head and thorax combined; flagellar joints sub-sessile, twice as long as broad, the terminal one longer. Head black or deep brown, levigate. Eyes contiguous above. Palpi brown. Thorax black, sub-nitidous, with three double longitudinal almost parallel rows of short brown hairs; also some long hairs on the lateral border and scutellum. Halteres dark brown, the stem sordid ochreous.

Abdomen umber-brown, paler between the segments, the terminal segments black; wider in the middle than the thorax; lamellæ of the ovipositor black, oval. Coxæ and femora sordid yellow; brown in the hind-legs; tibiæ and tarsi brown, the terminal joints of the latter black. In the fore-legs the tarsi somewhat longer than the tibiæ; in the intermediate-legs the tibiæ and tarsi of equal length; in the hind-legs the tibiæ somewhat longer than the tarsi. Spurs short, yellow. First joint of the tarsi 3 times the length of the second; second joint longer than the third and slightly shorter than the fourth and fifth together; the latter two of equal length. Wings pellucid, almost hyaline, with a very faint brownish tint, and having brilliant reflections; costal and first two longitudinal veins deep brown. First longitudinal vein joining the costa some distance before the base of the fork; cross-vein distinct; petiole paler than the fork, equal in length to the anterior branch; branches slightly, the anterior scarcely, divergent towards the tips; posterior branch slightly undulated. *fg* almost 4 times the length of *gh*; *kl* somewhat longer than *lm*.

Hab.—Mossman's Bay, near Sydney (Froggatt). August.

Obs.—Comes between *S. dolosa*, Sk., and *S. festina*, Sk.

456. *SCIARA SERENIPENNIS*, sp.n.

♂.—Length of antennæ	0.070 inch	...	1.77 millimètres.
Expanse of wings.....	0.090 × 0.033	...	2.27 × 0.84
Size of body.....	0.085 × 0.016	...	2.14 × 0.40

Antennæ black, densely covered with a yellowish or brownish pubescence; slender, nearly as long as entire body; flagellar joints sub-sessile, $2\frac{1}{2}$ to 3 times as long as wide. Head black, levigate. Eyes contiguous above. Palpi dark brown. Thorax black, sub-nitidous, with three longitudinal rows of yellowish or brownish hairs; intermediate row short, with minute hairs, scarcely reaching middle of thorax; lateral ones double or treble, reaching scutellum; some long hairs on the lateral borders and scutellum. Halteres black, the stem brown. Abdomen black, levigate, sparingly clothed with short yellowish hairs; not quite as wide as

the thorax ; forceps black. Legs blackish-brown. In the fore-legs the tarsi $\frac{1}{2}$ longer than the tibiae ; in the intermediate-legs the tarsi scarcely $\frac{1}{2}$ longer than the tibiae ; in the hind-legs, the tibiae and tarsi almost equally long, the latter very slightly longer. Spurs yellow, short. First joint of the tarsi about twice the length of the second ; second joint about $\frac{1}{2}$ longer than the third, and equal to the fourth and fifth combined. Wings hyaline, with rich golden reflections ; costal and first two longitudinal veins dark brown. First longitudinal vein joining the costa considerably before the base of the fork ; cross-vein very distinct ; petiole very pale, much paler than the fork, the same length as the posterior branch ; anterior branch $\frac{1}{2}$ longer than the posterior ; branches slightly divergent at the tips. *fg* $3\frac{1}{2}$ times the length of *gh* ; *kl* shorter than *lm*.

Hab.—Mount Kosciusko, N.S.W., 5000 ft. (Helms) ; in *Coll. Australian Mus.* March.

Obs.—Allied to *S. festina*, Sk.

c. *Tip of the posterior branch of the fork nearer the apex of the wing than the tip of the second longitudinal vein.*

111. SCIARA MÆSTA, Sk.

S. mæsta, Sk., l.c., p. 691.

One ♀ specimen from Hamilton, Upper Nth. Pine, Queensland (C. J. Wild), in January ; in *Coll. Queensland Museum*.

457. SCIARA CONJUNCTA, sp.n.

♂.—Length of antennæ.....	0·075 inch	...	1·89 millimètres.
Expanse of wings.....	0·085 × 0·030	...	2·14 × 0·76
Size of body.....	0·090 × 0·016	...	2·27 × 0·40

Antennæ black, with a minute pale pubescence ; moderately slender, $\frac{5}{6}$ the length of entire body ; flagellar joints with very short pedicels, 2 to 3 times as long as broad. Head black, subnitidous. Eyes contiguous above. Palpi brown or black. Thorax black, nitidous, with three longitudinal rows of short brown hairs ; the intermediate row single, short and indistinct ; lateral ones

reaching scutellum; lateral borders and scutellum with some long hairs. Halteres wholly black. Abdomen as wide as the thorax. black, sub-levigate, with short brown hairs; forceps narrower than the anal segment, black. Legs blackish-brown. In the fore- and intermediate-legs the tarsi about $\frac{1}{2}$ longer than the tibiae; in the hind-legs the tibiae and tarsi of equal length, nearly $\frac{1}{2}$ longer than the tarsi of the other legs. Spurs short, yellow. First joint of the tarsi rather more than twice the length of the second; second $\frac{1}{4}$ to $\frac{1}{2}$ longer than the third, and equal to fourth and fifth taken together; fourth and fifth of equal length. Wings hyaline, with brilliant blue and violaceous reflections; costal and first two longitudinal veins dark brown. First longitudinal vein reaching costa some distance before the base of the fork; petiole very pale and indistinct, a little shorter than the posterior branch of the fork; posterior branch nearly straight, only very slightly undulated; branches parallel for the greater part of their length, slightly divergent at the tips. *fg* 4 times the length of *gh*; *kl* slightly shorter than *lm*.

Hab.—Woronora, N.S.W. (Skuse). Eleven specimens in September.

Obs.—This species I place between *S. audax*, Sk., and *S. vecors*, Sk.

2. Palpi yellow.

B. Cross-vein situated at the middle of the first longitudinal vein.

a. *Tip of the second longitudinal vein nearer the apex of the wing than the tip of the posterior branch of the fork.*

458. *SCIARA PRÆCELLENS*, sp.n.

♀.—Length of antennæ.....	0·060 inch	...	1·54 millimètres.
Expanse of wings.....	0·165 × 0·057	...	4·18 × 1·44
Size of body.....	0·110 × 0·025	...	2·79 × 0·62

Antennæ dark brown or black, with a brownish pubescence; slender, longer than the head and thorax combined; joints of

scapus yellow (light reddish-brown in one specimen), sparingly pubescent; flagellar joints sub-sessile, 2 to 3 times as long as wide; the terminal joint slender, about twice the length of the penultimate one. Head black, sub-opaque. Palpi yellow. Thorax usually ochreous-yellow, somewhat shining, with three broad brown stripes; intermediate stripe short, disappearing before the pronotum; lateral ones starting before the humeri, extending to the scutellum; lateral borders and scutellum with long black or brown hairs; pleuræ brown or ochreous-brown; scutellum and metanotum varying from yellow to deep blackish-brown. Halteres deep brown or black, the basal half of stem yellow. Abdomen deep brown or blackish, the incisions paler; venter ochreous or ochreous-brown, clothed with short black or brown hairs; lamellæ of the ovipositor deep brown or black, short and rounded. Coxæ and femora yellow or brownish-yellow, with blackish hairs. Tibiæ and tarsi cinereous, the terminal joints of latter black (in one specimen the tarsi entirely black). In the fore-legs the tarsi nearly $\frac{1}{2}$ longer than the tibiæ; in the intermediate-legs the tarsi a little longer than the tibiæ; in the hind-legs the tibiæ slightly longer than the tarsi. Spurs yellow. First joint of the tarsi in the fore-legs $2\frac{1}{2}$, in the intermediate-legs 3, and in the hind-legs nearly 4 times the length of the second; second joint about $\frac{1}{3}$ longer than the third, and longer than the fourth and fifth combined; the latter two of equal length. Wings hyaline, brilliantly iridescent; all the veins (except petiole) distinct, deep brown or blackish. First longitudinal vein reaching the costa a short distance before the base of the fork; cross-vein distinct, situated at the middle of the first longitudinal vein; petiole extremely indistinct, except close to the fork, longer than the posterior branch and almost as long as the anterior; branches almost equally arcuated at the base, directed downwards for the anterior half, slightly divergent at the tips. *fg* not $\frac{1}{3}$ longer than *gh*; *kl* shorter than *lm*.

Hab.—Sydney, and Narara, Hogan's Brush, near Gosford, N.S.W. (Skuse); Dunoon, Richmond River, N.S.W. (Helms). Three specimens.

Obs.—I took two specimens in August, the other specimen was captured by Mr. Helms in March. This species is quite unlike any other known to me.

- b. *Tip of second longitudinal vein and tip of the posterior branch of the fork equally near the apex of the wing.*

123. *SCIARA LUCULENTA*, Sk.

S. luculenta, Sk., l.c. p. 705.

Seven ♀ specimens obtained by Mr. Helms at Mount Kosciusko, N.S.W., in March, at an elevation of 5000 ft., appear to undoubtedly belong to this species, but exhibit some differences. The antennæ are rather shorter (1·89 mm.), and the wings a little larger. Joints of scapus sometimes brown. Thorax with three dark brown stripes, or altogether deep brown or blackish, with a greyish bloom; pleuræ and pectus dark brown or black; scutellum and metanotum brown or dark brown. Coxæ and femora ochreous or brownish-ochreous. Wings pellucid, with a yellowish tint; veins dark brown. First longitudinal vein joining the costa a little nearer the base of the fork; petiole scarcely more than $\frac{1}{2}$ the length of the anterior branch of the fork, almost as long as the posterior branch. *fg* twice the length of *gh*.

- c. *Tip of the posterior branch of the fork nearer the apex of the wing than the tip of the second longitudinal vein.*

124. *SCIARA FUMIPENNIS*, Sk.

S. fumipennis, Sk., l.c. p. 706.

One specimen from Mount Kosciusko, N.S.W., 5000 ft. (Helms); in *Coll. Australian Museum*.

- C. Cross-vein situated beyond the middle of the first longitudinal vein.

- b. *Tip of the second longitudinal vein and tip of the posterior branch of the fork equally near the apex of the wing.*

459. *SCIARA CRASSICORNIS*, sp.n.

♂.—Length of antennæ.....	0·045 inch	...	1·13 millimètres.
Expanse of wings.....	0·066 × 0·025	...	1·67 × 0·62
Size of body.....	0·060 × 0·015	...	1·54 × 0·38

Antennæ dark brown or black, densely covered with yellowish pubescence ; rather stout, two-thirds the length of the entire body ; flagellar joints sub-sessile, 2 to 3 times as long as broad, progressively decreasing in thickness. Head deep brown or black, levigate. Eyes contiguous above. Palpi yellow. Thorax deep brown or black, sub-nitidous, with three longitudinal single rows of very short yellowish hairs ; intermediate row very short ; lateral ones reaching the scutellum ; humeri slightly tipped with ochreous ; lateral borders and scutellum with a few tolerably long black hairs. Halteres brown, the stem more or less yellow. Abdomen deep brown or black, narrower than the thorax ; the anterior incisions and venter brownish-ochreous ; densely clothed with very short black hairs ; forceps slender, black. Coxæ and femora yellow. Tibiæ and tarsi greyish, with a minute black pubescence. In the fore-legs the tarsi somewhat longer than the tibiæ ; in the intermediate-legs the tibiæ and tarsi of equal length ; in the hind-legs the tibiæ a little longer than the tarsi. Spurs yellow. First joint of the tarsi 3 times the length of the second ; second $\frac{1}{2}$ to $\frac{1}{3}$ longer than the third, and about equal to the fourth and fifth combined. Wings hyaline or almost so, with brilliant chalybeous and green reflections ; costal and first two longitudinal veins black or deep brown. First longitudinal vein reaching the costa a considerable distance before the base of the fork ; cross-vein distinct ; petiole invisible, exactly as long as the anterior branch of the fork ; base of fork indistinct, branches parallel, tips slightly divergent. *fg* twice the length of *gh* ; *kl* equal to *lm*.

Hab.—Dunoon, Richmond River, N.S.W. (Helms). March and April.

126. *SCIARA WINNERTZI*, Sk.

S. Winnertzi, Sk., l.c., p. 709.

This does not appear to be a common species. I took a single ♂ specimen during September last, at Woronora, N.S.W.

- c. *Tip of the posterior branch of the fork nearer the apex of the wing than the tip of the second longitudinal vein.*

132. *SCIARA SPECTABILIS*, Sk.

S. spectabilis, Sk., l.c., p. 716.

Several specimens from Dunoon, Richmond River, N.S.W. (Helms), in March and April. Very common about Sydney during March. I have also taken a single example in the month of December.

B. Halteres yellow or whitish.

1. Palpi black or brown.

B. Cross-vein situated at the middle of the first longitudinal vein.

- c. *Tip of the posterior branch of the fork nearer the apex of the wing than the tip of the second longitudinal vein.*

460. *SCIARA HELMSI*, sp.n.

♀.—Length of antennæ.....	0.035 inch	...	0.88 millimètre.
Expanse of wings	0.090 × 0.035	...	2.27 × 0.88
Size of body	0.075 × 0.013	...	1.89 × 0.32

Antennæ black, densely covered with a pale pubescence; slender, somewhat longer than the head and thorax combined; flagellar joints sub-sessile, twice as long as wide. Head black or deep brown, sub-opaque. Eyes contiguous above. Palpi brown. Thorax black, sub-levigate, with a greyish bloom, traversed by three longitudinal double rows of short yellow hairs; lateral borders and scutellum with some moderately long black hairs. Halteres pale yellow. Abdomen black or deep brown, wider than the thorax; clothed with short yellowish or brownish hairs; lamellæ of the ovipositor small, elliptical. Legs brown, the coxæ and terminal joints of tarsi black. In the fore-legs the tarsi scarcely longer than the tibiæ; in the intermediate-legs the tibiæ and tarsi of equal length; in the hind-legs the tibiæ about $\frac{1}{2}$ longer than the tarsi. Tibial spurs yellow. First joint of the tarsi rather more than twice the length of the second; second joint

about $\frac{1}{4}$ longer than the third, and equal to the fourth and fifth combined; the latter two of about equal length. Wings pellucid, almost hyaline, with a slightly greyish tint; margaritaceous reflections; costal and first two longitudinal veins brown. First longitudinal vein reaching the costa a little before the base of the fork; cross-vein tolerably distinct; petiole very pale, about $\frac{3}{4}$ the length of the posterior branch of the fork; branches slightly and gradually divergent. *fg* twice the length of *gh*; *kl* equal to *lm*.

Hab.—Mount Kosciusko, N.S.W. (Helms); *two specimens in Coll. Australian Museum.* March.

Obs.—Closely allied to *S. notata*, Sk.

C. Cross-vein situated beyond the middle of the first longitudinal vein.

c. *Tip of the posterior branch of the fork nearer the apex of the wing than the tip of the second longitudinal vein.*

461. SCIARA EXSEQUALIS, sp.n.

♂.—Length of antennæ.....	0·070 inch	...	1·77 millimètres.
Expanse of wings.....	0·083 × 0·030	...	2·09 × 0·76
Size of body.....	0·080 × 0·015	...	2·02 × 0·38
♀.—Length of antennæ.....	0·037 inch	...	0·90 millimètre.
Expanse of wings.....	0·105 × 0·037	...	2·67 × 0·90
Size of body.....	0·085 × 0·016	...	2·14 × 0·40

♂.—Antennæ black, with a pale pubescence; moderately slender, more than $\frac{3}{4}$ the length of entire body; flagellar joints with minute pedicels, $2\frac{1}{2}$ to 4 times as long as wide, the terminal joint considerably longer than the penultimate one. Head black, sub-opaque. Eyes contiguous above. Palpi dark-brown or black. Thorax black, sub-opaque, with three longitudinal double rows of short yellow hairs; lateral borders and scutellum with tolerably long black hairs. Halteres yellow. Abdomen black, clothed with yellow hairs; as wide as or rather wider than the thorax; forceps wider than the anal segment, black. Legs dark brown, the tarsi black. In the fore-legs the tarsi not quite $\frac{1}{4}$, in the inter-

mediate-legs about $\frac{1}{2}$, and in the hind-legs nearly $\frac{1}{2}$, longer than the tibiae. Spurs yellow. First joint of the tarsi twice the length of the second; second joint $\frac{1}{2}$ longer than the third and equal to the fourth and fifth combined; the latter two of equal length. Wings pellucid, almost hyaline, with a pale greyish tint; rather brilliant reflections; costal and first two longitudinal veins dark brown. First longitudinal vein reaching the costa considerably before the base of the fork; cross-vein tolerably distinct; petiole very pale, as long as or slightly shorter than the posterior branch of the fork; branches slightly and gradually divergent; posterior branch a little undulated. *fg* twice the length of *gh*, *kl* shorter than *lm*.

♀.—Antennae short, slender; flagellar joints sessile. Abdomen robust, deep brown, almost black, lighter between the segments; lamellae of the ovipositor small, oval. In the fore-legs the tarsi $\frac{1}{2}$, in the intermediate legs $\frac{1}{2}$, and in the hind-legs very slightly, longer than the tibiae. First longitudinal vein reaching the costa a short distance before the base of the fork; petiole shorter than the posterior branch of the fork. *fg* slightly more than twice the length of *gh*.

Hab.—Benalla, Victoria (Helms). Eight specimens in November.

Obs.—The venation of the wings at once distinguishes this species.

Genus ZYGONEURA, Meigen.

Zygoneura, Meig., Syst. Besch. VI. 1830, p. 304, pl. 65, fig. 15; Macquart, S. & B., Dipt., I. 1834, p. 158; Zetterstedt, Dipt. Scand.; Walker, Ins. Brit. III. 1856, p. 57; Schiner, F. A., Dipt., 1864; Winnertz, V. z.-b. G., Wien, XVIII. p. 11, 1867.

Characters the same as in *Sciara* with the following differences:—Antennae: the first joint of the scapus more bowl-shaped; in ♂ the flagellar joints oval, long-stalked and verticillate. Thorax glabrous. Tibiae without lateral spines. Wings: the branches of fork undulated, the anterior one much arcuated at the base, so that the fork appears bulged.

Only two species of the genus have hitherto been described, *Zygoneura sciarina*, Meig., from Europe, and *Z. toxoneura*, O.-Sack., North America.

462. *ZYGONEURA MACULIPENNIS*, sp.n.

♂.—Length of antennæ.....	0·070 inch	...	1·77 millimètres.
Expanse of wings.....	0·090 × 0·033	...	2·27 × 0·84
Size of body.....	0·090 × 0·015	...	2·27 × 0·38
♀.—Length of antennæ.....	0·070 inch	...	1·77 millimètres.
Expanse of wings.....	0·108 × 0·037	...	2·74 × 0·90
Size of body.....	0·125 × 0·020	...	3·16 × 0·50

♂.—Antennæ slender, nearly as long as entire body, black, densely covered with greyish pubescence; joints of scapus brown, sparingly pubescent; flagellar joints cylindrical, 2 to 3 times as long as broad, with short pedicels. Head black, nitidous. Eyes contiguous above. Palpi yellow. Thorax black, nitidous, with three very indistinct rows of very short hairs; a few short hairs on lateral borders. Halteres black, the stem yellow. Abdomen black, sub-nitidous, densely clothed with black or dark brown hairs; forceps black. Coxæ and femora yellow, the hind femora with the apical half brown; tibiæ greyish-yellow; tarsi blackish, the basal half of the first joint greyish-yellow. In the fore-legs the tibiæ very slightly shorter than the tarsi; in the intermediate-legs the tibiæ slightly longer than the tarsi; in the hind-legs the tibiæ about $\frac{1}{2}$ longer than the tarsi. In all the legs the first joint of the tarsi as long as, in the hind pair very slight longer than, the remaining joints taken together. Tibial spurs short, yellow. Wings pellucid, almost hyaline, with an indistinct pale brownish cloud over the basal portion of the fork of the third longitudinal vein; veins brown; brilliant reflections. First longitudinal vein joining the costa considerably before the base of the fork; cross-vein distinct, situated considerably beyond the middle of the first longitudinal vein; petiole longer than the posterior branch of the fork; anterior branch very much arcuated, the posterior one undulated; their tips not divergent; tip of posterior branch slightly nearer apex of wing than tip of second longitudinal vein. *fg* twice the length of *gh*; *kl* longer than *lm*.

♀.—Antennæ rather more than half the length of entire body; the apical half of eleventh flagellar joint and the three terminal joints entirely white or pale yellowish. Lamellæ of ovipositor oval. Clouding over the base of the fork larger and usually more distinct than in ♂, extending below the fork; also an indistinct pale clouding in the anal angle of wing.

Hab.—Sydney, and Hogan's Brush, Narara Creek, near Gosford, N.S.W. (Skuse). Five specimens in August.

Obs.—This species seems to differ from the type of the genus, and resembles *Z. toxoneura*, O.-Sack, in not having the joints of the antennæ verticillate, and having the pedicels short. The white-tipped antennæ of the ♀, if constant, afford a striking character.

EXPLANATION OF PLATE.

Fig. 1-1a. Galls formed by *Cecidomyia acaciæ-longifoliæ* on flower-stalks of *Acacia longifolia*; 1b, pupa of *C. acaciæ-longifoliæ*.

Fig. 2. Galls formed by *Diplosis frenelæ* on branchlets of the Desert pine, *Frenela Endlicheri*.

Fig. 3. Blisters formed by *Diplosis parilis* on the leaves of *Eucalyptus corymbosa*.

Fig. 4. Woody swellings formed by *Diplosis Eucalypti* on stems of *Eucalyptus hæmastoma*.

Fig. 5. Galls formed by *Hormomyia omalanthi* on the mid-rib on underside of leaves and in dense masses around the stems of *Omalanthus populifolius*.

Fig. 6. Malformed, coalescent leaf-stalks formed by *Lasioptera miscella* on *Eucalyptus hæmastoma*.

NOTES AND EXHIBITS.

Mr. Sloane showed specimens of several species of Coleoptera from the Richmond River District described in the Rev. T. Blackburn's paper.

Mr. J. H. Maiden exhibited a "core" of the caudex of *Xanthorrhœa arborea*, R. Br., together with transverse and longitudinal sections of the "core." He drew attention to its structure, which shows the distribution of fibro-vascular bundles and general arrangement of an endogenous stem, together with concentric rings (or rather markings in the form of concentric rings), and what strongly resemble medullary rays, reminding one of the structure of an exogenous stem. He cannot at present find any published references to the structure of this "core," but is continuing his inquiries. He also exhibited a fine section of an endogenous stem, 20 inches in diameter, from an unknown source, as it was found floating in the harbour. The botanical origin of this specimen is uncertain, and provoked discussion.

Mr. J. D. Ogilby exhibited two snakes from New Guinea, namely, *Brachysoma triste*, a rare Australian snake not previously recorded from New Guinea; and a death-adder (*Acanthophis*), much less robust than the southern species (*A. antarctica*), but not agreeing exactly with *A. lævis*, Macleay. The two specimens exhibited form part of a collection obtained by Sir William Macgregor at St. Joseph's River, and subsequently officially forwarded to the Australian Museum for identification.

Mr. Froggatt showed two large apple-shaped galls nearly two inches in diameter found on *Eucalyptus* sp., in the vicinity of King's Sound, N.W. Australia. They are the female galls of an undescribed species of gall-making Coccid (family *Brachyscelidæ*), and in the green state, along with the contained Coccus, are eaten by the natives of the Kimberley District.

Mr. Fletcher exhibited one living and several spirit specimens of *Notaden Bennettii*, Gthr., from three different localities, namely, Dandaloo, on the Bogan River (collected by Mr. A. Fletcher), Warren, on the Macquarie (collected by Mr. Thacher), and Narrabri (collected by Mr. Henry Deane); and he remarked that though this toad has hitherto been rare in collections yet in its native haunts it is at times not uncommon; and in two of the localities above-named he had been informed that during April and May of this year considerable numbers had appeared, though possibly the recently prevalent floods may have been concerned in bringing them prominently under notice. From what he had seen of living specimens in captivity the animals were expert burrowers, and from what he had heard as to their avoidance of water, their comparatively sudden appearance followed shortly afterwards by a noticeable diminution in numbers, he was inclined to think that the species perhaps resembled the American spadefoot toad (*Scaphiopus*) in keeping generally out of sight except during a short breeding period.

Mr. Ogilby remarked that Mr. Helms, who is still away on a collecting expedition for the Australian Museum, had recently sent down specimens of the same species from Bourke.

Mr. Etheridge exhibited the aboriginal weapons and implements described in his paper.

Mr. Skuse exhibited specimens of the Diptera described in his paper.

WEDNESDAY, 30TH JULY, 1890.

The President, Professor W. J. Stephens, M.A., F.G.S., in the Chair.

Mr. Albert Gale, Technical Education Branch, Department of Public Instruction; and Dr. Mann, F.R.G.S., Sydney, were elected Members of the Society.

The President announced that Mr. T. G. Sloane had been elected to a seat on the Council, *vice* Dr. Hurst, resigned on account of absence from the Colony.

DONATIONS.

"Reichenbachia.—Orchids Illustrated and Described by F. Sander, &c." Vol. II., Parts 11 and 12 (1889); "Berliner Entomologische Zeitschrift." XXXIII. Band, Heft 2 (1889). *From Sir William Macleay, F.L.S., &c.*

"The Journal of the Bombay Natural History Society." Vol. V., No. 1 (1890). *From the Society.*

"Matabele Land and the Victoria Falls." 2nd Edition, Appendix IV.—Entomology." By J. O. Westwood, M.A., F.L.S., with Additions by A. Sidney Olliff, and W. L. Distant. *From A. Sidney Olliff, Esq., F.E.S.*

"The University of Melbourne.—Matriculation Examination Papers." October Term, 1883, and February, 1884; "Examination Papers." October Term, 1883, and February, 1884. *From the University.*

"Mémoires de la Société des Naturalistes de Kiew." Tome X., Liv. 2 (1889). *From the Society.*

"The Australasian Journal of Pharmacy." Vol. V., Nos. 54 and 55 (June and July, 1890). *From the Editor.*

"The Eighteenth Annual Report of the Board of Directors of the Zoological Society of Philadelphia" (1889). *From the Society.*

"The Canadian Record of Science." Vol. IV., No. 2 (1890). *From the Montreal Society of Natural History.*

"The American Naturalist." Vols. XXIII., No. 275; XXIV., No. 281 (Nov., 1889, and May, 1890). *From the Editors.*

"Bulletin of the Museum of Comparative Zoology at Harvard College, Cambridge, U.S.A." Vols. XVI., No. 8; XIX., Nos. 2-4 (1890). *From the Curator.*

"Proceedings of the United States National Museum, Washington." Vol. XII., Nos. 782-786 (1890). *From the Museum.*

"United States Department of Agriculture. (i.) *Botanical Division—Bulletin*," Nos. 6, 7, and Special No. (1888-1889); (ii.) "*Division of Chemistry—Bulletin*," Nos. 14, 15, 17, 18, 21, 24-26 (1887-90); (iii.) "*Division of Entomology—Bibliography of the more important Contributions to American Economic Entomology*." By S. Henshaw. Parts i-iii. (1890); "*Insect Life*." Vols. I, II., No. 10 (1888-90); "*Bulletin*," Nos. 9, 10, 13-16, 18 and 19 (1886-88); (iv.) "*Division of Statistics—Reports*," n.s., Nos. 69-73 (1889-90), n.s., Miscellaneous, No. 1 (1890); (v.) "*Section of Vegetable Pathology—Bulletin*," No. 11 (1890); "*Quarterly Bulletin*," Vol. VI., No. 1 (1890); (vi.) *Bureau of Animal Industry—Annual Reports*," Nos. iv. and v. (in one), 1889; (vii.) "*Secretary's Reports*," Vol. I. (1889); (viii.) "*United States Entomological Commission—Reports*," Vol. III. (1883). *From the Secretary of Agriculture.*

"Proceedings of the Zoological Society of London for the year 1889." Part IV.; "Abstracts of Proceedings, 20th May, and 3rd June, 1890." *From the Society.*

"Transactions and Proceedings of the New Zealand Institute, 1889." (Vol. XXII). *From the Institute.*

Two Pamphlets entitled "A propos de la Nouvelle Organisation des Services de la Carte Géologique;" "Note préliminaire sur les restes de Siréniens recueillis en Belgique." Par Th. Lefèvre. *From the Author.*

"A Synopsis of the Queensland Flora." 3rd Supplement (1890). By F. M. Bailey, F.L.S., Colonial Botanist. *From the Author.*

"Geological Map to accompany Report on the Geology of the Kimberley District, Western Australia." By Edward T. Hardman. *From W. W. Froggatt, Esq.*

"The Perak Government Gazette." Vol. III., Nos. 17 and 18 (May and June, 1890). *From the Government Secretary.*

"Department of Mines, Sydney; Memoirs of the Geological Survey of New South Wales, Palæontology, No. 3.—Geological and Palæontological Relations of the Coal and Plant-bearing Beds of Palæozoic and Mesozoic age in Eastern Australia and Tasmania. By Dr. O. Feistmantel; No. 4.—The Fossil Fishes of the Hawkesbury Series at Gosford." By A. S. Woodward, F.Z.S., F.G.S. "Records of the Geological Survey of N.S.W." Vol. II., Part 1 (1890). *From the Minister for Mines.*

"Victoria.—Annual Report of the Secretary for Mines, 1889;" "Reports and Statistics of the Mining Department for the quarter ended 31st March, 1890." *From the Secretary for Mines.*

"Feuille des Jeunes Naturalistes." No. 236 (June, 1890); "Catalogue de la Bibliothèque." Fasc. No. 8 (1890). *From the Editor.*

"L'Académie Royale de Copenhague.—Bulletin pour 1889." No. 3; "1890." No. 1. *From the Academy.*

"Bulletin de la Société Belge de Microscopie." XVI. Année, Nos. 5 and 6 (1890). *From the Society.*

"Forhandlinger i Videnskabs-Selskabet i Christiania aar 1887." *From the Society of Sciences of Christiania.*

"Mémoires de la Société de Physique et d'Histoire Naturelle de Genève." Tome XXX., Seconde Partie (1889-90). *From the Society.*

"Abhandlungen herausgegeben von der Senckenbergischen Naturforschenden Gesellschaft, Frankfurt a.M." XVI. Band, Heft 1 (1890). *From the Society.*

"Verhandlungen der Gesellschaft für Erdkunde zu Berlin." Band XVII., No. 3 (1890); "Zeitschrift." Band XXIV., Heft 6; XXV., Heft 2 (1889-90). *From the Society.*

"Archiv für Naturgeschichte." 53rd Jahrg., Band II., Heft 3; 54th Jahrg., Band I., Heft 3; 56th Jahrg., Band I., Heft 1 (1887-90). *From the Editor.*

"Catalogue of Books added to the Radcliffe Library, Oxford University Museum, during the year 1889"; "List of Donations during 1889." *From the Library.*

"The Quarterly Journal of the Geological Society of London." Vol. XLVI., Part 2 (No. 182), 1890. *From the Society.*

"Department of Public Instruction, Sydney; Technical Education Branch: Technical Education Series, No. 6.—Wattles and Wattle-Barks, &c." By J. H. Maiden, F.L.S., F.C.S., &c. *From the Curator, Technological Museum.*

"Records of the Australian Museum, Sydney." Vol. I., No. 3 (1890); "Catalogue of the Australian Birds in the Australian Museum." Part II.—Striges; "Supplement to the Catalogue of the Australian Accipitres or Diurnal Birds of Prey in the Collection of the Australian Museum." By E. P. Ramsay, LL.D., &c. *From the Trustees.*

"Mémoires de la Société Nationale des Sciences Naturelles et Mathématiques de Cherbourg." Tome XXVI. (1889). *From the Society.*

"Tables des Comptes Rendus des Séances de l'Académie des Sciences, Paris." Second Semestre, 1889 (Tome CLIX.). *From the Academy.*

"The Agricultural Gazette of New South Wales." Vol. I., Part 1 (July, 1890). *From the Director, Department of Agriculture.*

"Calendar of the University of Sydney for the year 1890." *From the Senate.*

"Mémoires de la Société Royale des Sciences de Liège." 2nde Série, Tome XVI. (1890). *From the Society.*

"Zoologischer Anzeiger." XIII. Jahrg., Nos. 336 and 337 (1890). *From the Editor.*

"Records of the Geological Survey of India." Vol. XXIII., Part 2 (1890). *From the Director.*

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GEOLOGICAL NOTES.

BY T. W. EDGEWORTH DAVID, B.A., F.G.S.

(1) NOTE ON THE LACCOLITES OF THE JUNCTION MINE, NEAR
MANDURAMA.

The Junction Mine, near Mandurama, has long been famous for the remarkable character of its auriferous deposits. These have been described by previous writers as ore beds, on account of their comparatively low angle of dip and general conformity with the bedding planes of the sedimentary strata, with which at first sight they present the appearance of being interstratified. A recent examination, however, of these deposits by the author in company with Mr. G. A. Stonier, geological surveyor, has convinced him that these deposits are not true ore beds, but laccolites.

Omitting the basalts and their underlying gravels, the author thinks that three distinct varieties of rock are developed at this mine, each probably belonging to a different geological date.

(1) First and oldest are claystones showing remarkable evenness and regularity of bedding, felspathic layers alternating with more siliceous, while on certain horizons are intercalated thin beds of limestone. The author is indebted to Professor W. J. Stephens, F.G.S., for the information that *Pentamerus* occurs in these limestone beds on Mr. Rothery's run, not far from the Junction Mine, and also for the suggestion that continuations of these beds have been replaced by the laccolitic eruptive rocks at the Junction Mine, a conclusion which the author had preconceived before communicating with Professor Stephens, as a result of observing the abundance of calcite in the undecomposed portions of the laccolites, and the occurrence of a small bed of partly silicified limestone at the Belubula Mine, just below the Junction Mine.

(2) Next in age are diorites, which have intruded the preceding rocks in the shape of dykes and laccolites. The diorite varies in texture from crystalline-granular to crypto-crystalline, and in colour from greenish-grey to dark blackish-green. At "The Falls," above the Junction Mine, is probably one of the most magnificent sections illustrative of laccolitic intrusions to be seen in New South Wales. An immense dyke of diorite is here seen to have intersected the claystones almost vertically, and at intervals of from a few inches to about twenty feet it has extended itself laterally along the planes of bedding of the claystones in sheets of from $\frac{1}{2}$ -inch to about 20 feet in thickness, and from a few feet to over 100 yards in length. At first sight the precipitous hill-side here appears to be composed of alternate beds of eruptive rock and altered sedimentary strata, at first mistaken by the author for a volcanic series of lavas alternating with fine tuffs. A closer examination, however, convinced Mr. Stonier and the author that these apparent beds were in reality intrusive laccolites, as evidenced by the slightly intrusive character of the junction line of their upper and under surfaces with the sedimentaries, their unbroken continuity with the diorite of the large dyke, the abundance of hornblende in them, and lastly the development of small light grey spots in the claystones near the point of contact, due probably to the formation of chiasolite. In places the laccolites have brought about a partial solution or fusion of the intruded sedimentaries, and where they pass into the so-called ore beds the author thinks they have intruded and replaced probably beds of limestone, absorbing into themselves the lime so as to form a type of rock of an ultra-basic character, for which perhaps the term *Manduramite* may be suggested. This *Manduramite* consists of a coarsely crystalline admixture of calcite and primary hornblende with perhaps some felspar, and abundant magnetic, arsenical, and iron pyrites, with a little copper pyrites. It occurs in lenticular masses from a few feet up to 20 feet thick. The junction line of the *Manduramite* with the claystone is clearly an intrusive one, the claystone being much bleached and altered into a whitish jasperoid rock at the points

of contact. The oxidation of the laccolites of Manduramite, where they have been brought by denudation within reach of the action of surface-water and the atmosphere, has given rise to the ferruginous masses of material (in places very siliceous, and generally more or less porous from the decomposition of iron and lime) which have been worked for gold for many years past, and which yield from mere traces up to over an ounce of gold per ton. The metalliferous portions of these deposits have probably been derived from metallic solutions in the diorites, which are very pyritous, especially those varieties which contain an abundance of hornblende. A small quantity of the metals present in the ore masses may have been derived perhaps from the replaced limestone.

(3) Next in order and youngest of the three formations are certain dykes of later date than the laccolites, as there is distinct evidence of the former having strongly intruded the latter. This intrusion seems to have exerted a certain amount of segregative influence on the metals present in the laccolites, as Mr. Stonier and the author were informed by the manager, Mr. Hogue, that the ore masses were richer in the vicinity of these dykes than at a distance from them. The micro-petrological character of these newer dykes has yet to be determined.

Conclusions.—The manner in which the intrusive laccolites of diorite have crept along the planes of bedding of the sedimentary rock and absorbed some portions of the claystone, and probably a large proportion of limestone into their substance, is very suggestive as to the possible origin of certain remarkable varieties of rock in New South Wales hitherto classed as metamorphic. It has been asserted by Mr. C. S. Wilkinson, F.G.S., and Mr. E. F. Pittman, Assoc. R.S.M., that at Hill End and elsewhere there occur metamorphic conglomerates containing undoubted water-worn pebbles in a matrix showing freely crystallised felspar. The author also has observed the same phenomena at Vegetable Creek, where a bed of conglomerate can be traced passing by almost insensible gradations into a true eruptive quartz-porphyry, the latter showing

the vanishing outlines of the pebbles of the conglomerate. In the last-mentioned case at all events the author is now confident that the phenomenon is due to the laccolite of quartz-porphry attacking the conglomerate and dissolving and partly replacing the more fusible portions of it, which would chiefly be its base, whereas its less fusible portions, such as pebbles of quartzite, would still remain unfused, though in many cases completely surrounded by the quartz-porphry. A further investigation of these metamorphic conglomerates will, the author feels confident, lead in some cases to the adoption of the theory now put forth to account for their origin as being probably nearest the truth.

(2.) NOTE ON THE OCCURRENCE OF *GLOSSOPTERIS* IN A REMARKABLE STATE OF PRESERVATION IN THE GRETA COAL-MEASURES AT RICHMOND VALE NEAR MAITLAND.

So far as the author is aware, *Glossopteris* has hitherto been met with in the fossil state either in the form of casts or impressions, the original carbonaceous material having completely disappeared, or in the form of carbonaceous material representing the original vegetable matter of *Glossopteris*, but structurally much altered. Recently, however, the discovery has been made of *Glossopteris* leaves, in only a slightly altered condition, in the clay shales of the *Greta Coal-Measures* at Richmond Vale, twelve miles southerly from Maitland. A large shaft has been sunk here by the Richmond Vale Syndicate, which at a depth of about 690 feet (the shaft throughout to that depth being in the Upper Marine Series containing an abundant Permo-Carboniferous Marine Fauna) struck the first of the Greta Coal Seams; at 22 feet (about) below the first seam a bed of grey sandy shale was passed through, 8½ feet in thickness, the upper portion of which contained layers of *Glossopteris* leaves in great abundance. The leaves occur matted together in layers from ½ of an inch to 1 inch thick. Owing to the great pressure to which they have been subjected it is a matter of considerable difficulty to disentangle any individual leaves from

these layers. After prolonged soaking, however, in water, fragments of the clay shale can be so far softened as to admit of individual leaves being separated out. When isolated and mounted on glass slips for the microscope they are seen to be quite translucent, having a reddish-brown colour, and showing their venation very clearly. On some of the leaves dark oval-shaped bodies may be observed, which in one or two cases appear to be symmetrically arranged on the leaves, and may possibly represent fructification. Mr. R. Etheridge, jun., however, after a careful examination of these specimens has come to the conclusion that the evidence on this point is at present insufficient. From the absence of a well defined midrib in some of the specimens, he thinks them allied to *Gangamopteris* rather than to *Glossopteris*. The occurrence of *Gangamopteris* has not, as far as the author is aware, been recorded hitherto from the *Greta Coal-Measures*.

Several of the *Glossopteris* leaves, when *in situ* in the clay shale, were observed to be rolled up longitudinally. This, however, was evidently due to the mechanical action of the water and mud in which they were deposited, for this phenomenon was accidentally imitated artificially by swilling the water gently to and fro in the tub in which the *Glossopteris*-bearing clay shale was being macerated, many leaves which had previously been lying flat, becoming rolled up in the same manner as the natural specimens. It is hoped that a sufficient quantity of these leaves may be obtained for chemical analysis.

Although this appears to be the first recorded instance in Australia of fossil plants occurring in this peculiar state of preservation in rocks so old as the Permo-Carboniferous, similar phenomena have already been observed by the Rev. J. Milne-Curran, F.G.S.,* and Mr. T. Whitelegge.† In the paper referred to Father Curran recorded the discovery by himself of pinnules and leaflets of *Alethopteris* and *Thinnfeldia* in a similar state of preservation to that above described in layers of sandy shale in the Ballimore

* P.L.S.N.S.W., 1884, IX., pp. 251, 252.

† *Ibid.*, 1885, X., p. 62.

Series near Dubbo. This series is considered by Mr. C. S. Wilkinson, F.G.S., and by Father Curran to be probably older than the Hawkesbury Sandstone proper, and perhaps to be the equivalent of the Narrabeen Series, in which case it would probably be of Triassic age. Mr. Whitelegge records a similar occurrence of leaflets of *Thinnfeldia* in a band of carbonaceous clay shale in the Hawkesbury Sandstone at Woolloomooloo near Sydney, a geological horizon probably also referable to the Trias.

(3) NOTE ON THE OCCURRENCE OF ANDESITIC LAVAS AT THE
CANOBLAS, NEAR ORANGE.

At the above locality are the remains of an extremely interesting extinct volcano, which has so far been very little studied. Mr. C. S. Wilkinson made a cursory visit to the Canoblas in the year 1878, and at once concluded from the scoriaceous character of the lavas at the summit of the "Old Man Canoblas," as well as from the great altitude and isolated character of the hill that it had at one time formed a point of volcanic eruptions on a somewhat grand scale. In January of this year, at the meeting of the Australasian Association for the Advancement of Science, a note was read by the Rev. J. Milne Curran, F.G.S., recording the occurrence of a nepheline-bearing basalt, which had evidently flowed from the neighbourhood of the Canoblas, near Orange. The author is not aware of any further published accounts of the Canoblas or of their lavas. Mr. G. A. Stonier, Geological Surveyor, and the author on July 5th last, ascended to the summit of the "Old Man Canobla," by the road which branches from the main Orange to Cargo road at German's Hill.

At a point about $1\frac{1}{4}$ miles along the branch road a bed of thick volcanic tuff outcrops, composed of an ochreous base containing fragments of lava and scorice of an andesitic rather than a basic type, together with beautifully perfect crystals of black augite from $\frac{1}{4}$ to $\frac{3}{4}$ of an inch in length.

From here to near the summit the road passes over sheets of dense lava rendered porphyritic by crystals of triclinic felspar,

and a few hundred feet below the summit a small sheet of laminated or vertically jointed andesite lava is observable dipping at a somewhat steep angle off the central axis of the mountain. This lava is traversed by such numbers of vertical joints and set so closely together as to present the appearance of being a mass of slate. Microscopic examination, however, proves it to be identical, or nearly so, in composition with the rest of the andesitic lavas of this locality. Its specific gravity is 2.462.

At a point bearing about S. 15°, W. 78 yards distant from the Trigonometrical Station on top of the "Old Man Canobla," is what the author considers to be the central "neck" of the volcano, in the shape of a nearly circular mass of coarsely crystalline and very dense andesitic lava, rising from four to five feet above the general level, and showing strongly marked oblique lamination, the laminæ dipping in towards the centre of the neck at an angle of from 40° to 60°. The neck is about $\frac{1}{2}$ chain in diameter, and is surrounded by beds of scoriaceous lava to the north and scoræ to the south. The beds of the former to the north dip northerly at about 15°, and are overlaid by a dense flow of lava, on the highest point of which the Trigonometrical Station now stands.

South of the neck the beds of scoræ dip first northerly towards the neck, then qua-qua-versally chiefly from west towards south at an angle of from 20° up to 40°, as far as the western edge of the mountain, where the scoræ pass into a coarse volcanic agglomerate composed chiefly of large pieces of cellular andesitic lava. The southerly dip here probably represents the dip of the beds on the outer slope of the old crater, while the northerly dip towards the neck represents the crater-ward dip.

A curious semi-circular hollow floored with dense lava is observable a few chains south-south-westerly from the Trigonometrical Station, but in the present denuded state of this ancient volcano it is difficult without detailed mapping to ascertain its exact relation to the central neck

Only a few sections of these lavas have as yet been microscopically examined by the author. They appear to be closely related to the copper-bearing andesitic lavas of Kiama, which, as will be described in a subsequent note, are probably of Permo-Carboniferous age. Some of the older lavas which have emanated from the Canoblas, are also copper-bearing, as at the copper mine near Walli.

The Pinnacles, a mammillated hill about one mile northerly from the "Old Man Canobla," probably marks the site of a parasitic cone.

ON GRASS-TREE GUM.

BY J. H. MAIDEN, F.L.S.

PART I.—PARTICULARS MORE OR LESS APPLICABLE TO ALL THE SPECIES.

Botanical Origin.

Grass-tree "gum" is the produce of various species of *Xanthorrhœa*. There are twelve species of this genus, which belongs to the Liliaceæ, and several (perhaps all) exude resin from the caudex. A synonym of one or more species is *Acaroides resinifera*, Gray.*

Writers on the subject have usually simply alluded to the resin as that of *Xanthorrhœa*, without denoting the species, and sometimes without giving a description of the resin. Under these circumstances, it is frequently impossible to denote with certainty the species alluded to. Still, of the species obtained from Sydney, it may generally be said that the light (yellow) coloured resin is the product of *X. hastilis*, while the darker (red) one must have been obtained from *X. arborea*.

The plants are always known as "grass-trees," owing to the rush-like or grassy tufts of leaves which adorn the stem. In the very early days they were sometimes called "dwarf palm trees." The term grass-tree "gum" is of course scientifically untenable, as it is insoluble in water; it is soluble in spirit and is a true

* I have been at much pains to endeavour to trace this genus. It has nothing to do with Asa Gray's visit to Australia, as it was in use at least as early as 1795 (see "BIBLIOGRAPHY"). It is not to be found in the *Genera Plantarum* of Bentham and Hooker, nor in any of the works of similar scope in the French and German languages to which I have had access. I suppose, therefore, that it never had any claim to the acceptance of botanists, and it might be consigned to oblivion except that it originated the names "acaroid resin" and "gum accroides," which are to be seen in English standard works by the score. The former is even used in a work of high importance published in the present year (Morley and Muir's *Watts' Dictionary of Chemistry*). It is apparently a name coined by English druggists to denote a product which came to them without a name, and it has never been used in Australia so far as I can learn.

resin. It is occasionally called "black-boy gum," and in English books now and then "ascaroid resin" or "gum accroides." It has also been called "Botany Bay resin."

Collection and Commerce.

"Grass-tree gum" is in small demand, the ordinary retail price being from fourpence to sixpence a pound in Sydney, and the wholesale price of course much less. As usually found in commerce, the resin of *X. hastilis* is in very small pieces (almost powder), or else these small pieces are aggregated, forming a friable mass. In this state it is more or less impure, being mixed with soil and fragments of the bases of the leaves. *X. arborea* resin is usually in larger masses. After a bush-fire (or even the heat of the sun) has passed over grass-trees, the heat causes the resin to run into more or less spherical masses, which are sometimes also darkened, either from destructive distillation, or possibly by admixture with carbon particles. I have some pieces as spherical as if turned in a lathe. These masses can be picked out either from the interior of the charred stump, or from the ground at the place where a grass-tree once grew. Such masses present the resin in a very pure form, but collecting in this way would entail too much labour to be profitable commercially.

Following is a description of the method of obtaining grass-tree "gum."

The articles required are an axe, a flail, a coarse sieve, and a sheet. The stems of the grass-trees are chopped down, broken up into convenient pieces, and allowed to fall into the sheet. A stout stick or flail completes the work of disintegration. The substance is then passed through the sieve, the ligneous portions of the grass-tree for the most part failing to pass through its meshes. A gentle breeze is considered sufficient to winnow what has passed through the sieve, and render it ready for the market. But it often comes to Sydney without having been subjected to any winnowing process.

An interesting (though now somewhat out of date) account of grass-tree "gum," by Mr. P. L. Simmonds, will be found, *Pharm. Journ.* [2], viii, 78. It is, however, to be observed that the

Following are some remarks on *Xanthorrhœa* resins by the expert appointed to report on such substances at the Colonial and Indian Exhibition (*Reports*, p. 286). Coming from such a source they carry weight, and are an encouragement to endeavour to properly place grass-tree "gum" on the market. The complaint as to the unequal quality of the commercial article should be taken to heart by those concerned.

"One may regard the resinous element of the *Xanthorrhœa* gums as the constituent more immediately to be utilised industrially, as one would suppose the European markets to be open to receive a very large amount of this material, if sold in such a form that the average consumer could see it readily. The crude gum does not look very attractive to the purchaser in the European market, as it contains a large—and what is worse, a very variable—percentage of matter insoluble in alcohol; and its purchase would involve an assay of each consignment, together with the attendant inconveniences, and the possibility of misunderstanding. Apart from this, it must be remembered that manufacturers—especially small manufacturers—have a rooted, and not altogether unreasonable, objection to use a variable article, as it disturbs the routine of their operations." All these considerations—to say nothing of the saving of freight—point strongly to the desirability of roughly purifying the resin before sending it to Europe. A sufficient purification is a very simple matter, and could be well carried out on the spot where the material is found, thus saving expense in land as well as ocean transit. It would suffice to soften the crude gum by heat, and to squeeze the softened resin through cloth or through a fine iron wire netting, such as is used for straining gutta-percha. The heat of boiling water is sufficient for the purpose. The separated resin could well be put on the market as an approximately constant article—varying mainly as regards colour—and one which numberless small producers could use in their trades. The water in which the crude gum is boiled dissolves out more or less colouring matter, and also astringent or tanning substances,*

* These products are only present in insignificant quantities, and utterly unworthy of commercial notice.—J. H. M.

and possibly, if the purification were undertaken on a larger scale, these might be turned to account."

Uses.

The aborigines prepare cakes of it for the purpose of fastening on the heads of spears, &c. But I have no doubt that a good deal of the "black gum" which is frequently referred to in books as being used for that purpose, is the product of a *Myoporum*, probably *M. platycarpum*.

The complete heads of W.A. spears are "stained with the gum of *Xanthorrhoea* to render them smooth and impervious to moisture" (Brough Smyth, i., 336, 340, 341).

Grass-tree "gum" is frequently used instead of shellac, in the manufacture of inferior sealing wax.

It is used by Chinese polishers, and also by some Europeans, as a substitute for shellac in French polishing; but its use for such a purpose is to be deprecated for the following reasons:—Work done with it is more or less sticky at first, though afterwards it frequently becomes so hard and brittle as to peel off like blistered paint. The result, whichever of the two things happens, is that French polish cannot subsequently be used on the article except after stripping. Other objections are that the wood darkens and often shows a play of colours. Also, water leaves white marks if splashed on the grass-tree gum polish; from benzoin or shellac polish it can be wiped off without injury.

Mr. Charles Moore (*Reports, Sydney Int. Exhibition, 1879*), states that grass-tree gum is "used for coating the bottoms of punts and small boats, and is said to be a good preservative."

It could probably be used in candle-making, for it burns by itself with a bright flame, and mixes with fat in all proportions. It is used in the manufacture of sealing-wax, lacquers, japanners' gold size, &c., and generally as a substitute for shellac. "An excellent spirit varnish" is said to be made from this resin by adding to about one gallon of methylated spirit (cold) about $2\frac{1}{2}$ lbs. of "gum," about $\frac{3}{4}$ lb. of common resin, and $\frac{1}{2}$ lb. of shellac, and then straining through a muslin cloth.

The medicinal properties of grass-tree gum appear to be not well marked. As early as 1795 acaroid resin was said by Kite (see "BIBLIOGRAPHY") "to neither vomit, purge, nor bind the belly, nor to act materially as a diuretic or diaphoretic. Dr. Fish (*Boston Journ.*, x., 94) employed it in the form of tincture with opium in fluxus hepaticus and the colliquative diarrhoea of phthisis, and it has been recommended in chronic catarrhs. A tincture of acaroid resin which has been given in doses of one to two fluid drams, with milk or a mucilaginous liquid, has been recommended to be made of equal weights of the resin and alcohol, and, according to another formula, of 2 ounces of resin to 1 pint of alcohol. If used at all, the latter formula would appear to furnish a preparation of the proper strength." [Prof. H. C. Maisch (see "BIBLIOGRAPHY")]. The subject of medicinal qualities is further dealt with under *X. hastilis*, p. 434.

The *Xanthorrhœa* resins have been repeatedly suggested as possessing some value in perfumery, but they are inferior for this purpose to benzoin, storax, and the balsams of peru and tolu. Some of them which contain benzoic acid are aromatic when burnt, and owe their pleasant odour wholly or in part to that substance. Abundance of picric acid, a very powerful yellow dye, can be obtained from grass-tree "gum." But this substance can be so cheaply made from coal-tar, that grass-tree gum is not now thought of for that purpose. The result is that many storekeepers in the colonies, who eagerly bought up grass-tree "gum" as a speculation, with the view of exporting it to England, have for years past had stocks on hand, and quantities now sold have frequently been gathered say fifteen or twenty years.

PART II.—*XANTHORRHŒA HASTILIS* (THE SPECIES USUALLY ALLUDED TO BY WRITERS AS GRASS-TREE "GUM").

XANTHORRHŒA HASTILIS, R.Br., B.Fl., vii., 115.

Found in New South Wales and Queensland.

This remarkable plant, and its exudation of resin, attracted the very early attention of the first colonists. Probably their attention would have been invited to it in the first instance by the blacks,

who still use it as a cement, as has already been mentioned. For the earliest actual allusions to the resin of *X. hastilis*, I am indebted to Barton's "History of New South Wales," pages 280 and 504.

On the 15th of May, 1788, Governor Phillip alludes to "the yellow gum which is found on the dwarf palm tree."

On the 18th of November of the same year "an officer of Marines" speaks of "some of which have been used medicinally with success by the surgeon, Mr. Considen, particularly the yellow gum, a substitute for balsam of tolu." The statement is hard to comprehend, as grass-tree "gum" is as unlike balsam of tolu as it can possibly be, nor has its use in medicine been continued.

Both Surgeon-General White and Governor Phillip notice it in the books they wrote on the Colony. Following are their statements:—

"The Yellow Resin Tree."

"But the most valuable produce of this plant seems to be its resin, the properties of which vie with those of the most fragrant balsams. The resin exudes spontaneously from the trunk; the more readily if incisions are made in its bark.* It is of a yellow colour; fluid at first, but being inspissated in the sun, it acquires a solid form. Burnt on hot coals it emits a smell very much resembling that of a mixture of balsam of tolu and benzoin, somewhat approaching to storax. It is perfectly soluble in spirit of wine, but not in water, nor even in essential oil of turpentine, unless it be digested in a strong heat. The varnish which it makes with ether is very weak, and of little use. With respect to its medicinal qualities, Mr. White has found it in many cases a good pectoral medicine, and very balsamic." (Dr. James Smith, in "Journal of a Voyage to New South Wales," by John White, Esq., Surgeon-General to the Settlement, 1790, p. 235. No figure of this plant is given, but some old basal leaves are figured.)

In "The Voyage of Governor Phillip to Botany Bay," 1790, a crude figure of this *Xanthorrhœa* is given, and (p. 51), concerning the resin, it says . . . "in appearance it strongly resembles

*I have never heard of a *Xanthorrhœa* being subjected to this treatment.

gamboge, but has not the property of staining. . . . The resin is generally dug up out of the soil, under the tree, not collected from it, and may perhaps be that which Tasman calls 'gum-lac of the ground.'"

Its ordinary appearance in the bush is of a dirty crimson colour. It readily fractures, and it is then seen that this colour is only superficial, and that the resin is yellow or orange-coloured, strikingly-like (in appearance) gamboge, and sometimes like the artificial Burgundy pitch of the shops.

It is well known for the pleasant perfume it exhales when exposed to sufficient heat to volatilize it without decomposing it completely. In Curtis' *Bot. Mag.*, 79, 4722, it is alluded to as "spear yellow gum," and the statement is made that it is "now used, we are told, as incense in the Roman Catholic churches of the Colony."

In Wagner's *Chemical Technology* (Crookes), p. 484, the statement is made that "New Zealand resin, the produce of *Xanthorrhæa hastilis*,* is now frequently used instead of shellac." No species of *Xanthorrhæa* extends to New Zealand.

The following are a few experimental notes on this interesting resin.

A sample collected by the author near Sydney represents the resin in a very pure form, as no pains have been spared to pick out lumps free as possible from adventitious matter. It possesses a sweet odour† similar to that of benzoin, which is much increased on powdering the substance. It fractures readily with a shining fracture, and is reducible with the greatest facility to an impalpable powder. No substance bears a greater resemblance to it than powdered gamboge, although that pigment is perhaps a shade darker. Exposure to the light causes the resin to change its colour to Indian red, which is the external colour of masses of pure resin. This colour is only superficial. It does not soften in

* Perhaps kauri resin (*Dammara australis*) is, however, meant.

† "When fresh it has an odour analogous to that of poplar buds, but much more agreeable (Guibourt), while Maisch likens the smell to benzoin mixed with a little storax. By age the odour becomes weaker, and gradually disappears, but it is always developed by powdering or by fusion."

the mouth, but crunches readily, tinging the saliva yellow, and tasting of benzoic acid to a far greater extent than *X. arborea*.

In boiling water the resin melts, the water becoming slightly turbid and of a lightish yellow colour.

Petroleum spirit extracts 1 per cent. of a fragrant body, but apparently containing no benzoic acid.

Alcohol digested on the residue dissolves 94.6 per cent., forming a beautiful yellow liquid. As evaporation proceeds, benzoic acid in beautiful feathery crystals separates out, and the resin collects at the bottom of the vessel, the whole smelling strongly of benzoic acid. This resin melts at 97.7° C. Beyond applying the usual tests for that substance,* nothing further was done in regard to it, for lack of time.

The accidental impurity was 5.3 per cent. (vegetable debris and sand).

A second sample purchased in Sydney is in small pieces admixed with a little ligneous matter. The description already given of this resin will apply here, except that it has a lower melting point, the heat of a Sydney summer fusing it and causing it to run together in the bottles. It is very strongly and deliciously aromatic. Petroleum spirit extracts 2 per cent. of a pale-coloured sticky substance, which is probably a mixture of essential oil and resin.

A third sample from Shoalhaven, N.S.W., collected 14th August, 1886, was then examined.

Petroleum spirit dissolves out 2 per cent. The general effect of cold alcohol and subsequent slow evaporation is the same in this sample as in that already described. The alcohol dissolves out 91.7 per cent. of resin and benzoic acid combined.

The residue (accidental impurity) amounts to 8.1 per cent.

* Stenhouse obtained a quantity of cinnamic acid, in far greater abundance than the benzoic acid, from a sample of *X. hastilis* resin examined by him. But, although I carefully examined the groups of crystals obtained, with regard to physical appearance, and also mixed both them and samples of the original resin with binocide of manganese and sulphuric acid, I failed to obtain indications of cinnamic acid. I hope some time, however, to give the resin a more thorough examination.

This interesting resin has formed the subject of chemical researches for nearly one hundred years. Following are abstracts from some of them,—none of them recent. A modern research is a desideratum.

“Of a darker reddish-yellow than gamboge, frequently covered with a greenish-grey crust. Brittle, of shining fracture, triturable to a greenish-yellow powder. Does not stick to the teeth. Tastes sour and aromatic, and has an agreeable balsamic odour. Contains a very small quantity of an agreeably-smelling volatile oil; a resin soluble in alcohol and ether, and also in alkalis and baryta- and lime-water; a little benzoic acid and bassorin (Laugier, *Ann. Chim.*, 76, 265). Its solution in ether or alcohol leaves on evaporation a dark resin, containing, at 120°, 66.98 p.c. C, 5.73 H, 27.29 O, corresponding to the formula $C_{40}H_{20}O_{12}$, and almost entirely precipitable from its alcoholic solution by water, even in the presence of a large quantity of ammonia.” (Johnston, *Phil. Trans.* 1839, 292.)

“The resin gives up to boiling water benzoic acid and gum. It dissolves in oil of vitriol, forming a pale brown solution, which is precipitated of a violet-red by water. It colours acetic acid yellow, without dissolving in it to any great extent and dissolves easily in alcohol, ether, some volatile oils, and partially in fatty oils, forming in all cases fine yellow solutions” (Widmann; Lichtenstein) [Gmelin's *Handbook*, xvii., 386-7].

“Colour deep yellow, with a slightly reddish shade, considerably resembling gamboge, but darker and less pleasing. The colour of its powder is greenish-yellow. When gently heated it melts, and when strongly heated it burns with a strong smoky flame, and emits a fragrant odour resembling balsam of tolu. The resin contains a trace of an essential oil, to which much of its agreeable smell is owing. This oil passes into the receiver when the resin is distilled with a mixture of carbonate of soda and water, but its quantity is so small that I was unable to examine it more closely. The resin is insoluble in water, but dissolves readily both in alcohol and in ether, especially in the former. Its solution in

alcohol has a brownish-yellow colour; the addition of water precipitates it as a dark yellow mass, but it does not crystallize out of its alcoholic solution when left to spontaneous evaporation, but remains as a varnish. When digested with strong alkaline lyes, it readily dissolves and forms a brownish-red solution; and when the alkali is neutralized with muriatic acid, the resin is precipitated considerably altered as a dark brownish brittle mass.

"On concentrating the solution out of which the resin has been precipitated, and allowing it to cool, a quantity of impure reddish crystals resembling benzoic acid are gradually deposited. It requires repeated and long-continued digestions with the strongest alkaline lyes to remove the whole of this crystalline acid from the resin, which retains it with very great tenacity. The quantity of the acid is by no means great. It is not easily purified, as its crystals are apt to retain a trace of a reddish colouring matter, from which it is very difficult to free them. The easiest way of getting rid of it is by dissolving the impure crystals in a small quantity of alcohol and then adding water; the greater portion of the colouring matter is retained in solution, while the crystals are precipitated tolerably white. When purified by repeated crystallizations, they become quite colourless. In appearance, taste, and smell, they closely resemble benzoic acid.

"The quantity of carbazotic (picric) acid which Botany Bay resin yields when treated with nitric acid is so great, and it is so easily purified, that this resin seems likely to prove the best source* of that substance. When the resin is subjected to destructive distillation in an iron or copper retort, it yields a very large quantity of a heavy acid oil mixed with a very small quantity of a neutral oil, which is lighter than water. If, however, the resin has been previously digested with alkaline lyes, so as to remove all the cinnamic and benzoic acids it contains, the heavy oil is obtained as before, but none of the light essential oil. The acid oil is readily soluble in soda and potash lyes; in its smell and properties it resembles creosote; when it is digested with nitric

* Superseded by coal-tar now, of course.

acid, it is wholly converted into carbazotic acid, and when a slip of fir-wood is dipped in it, and then moistened with either muriatic or nitric acid, the deep blue colour passing quickly into brown, so characteristic of hydrate of phenyle, is immediately produced, with which substance the oil appears completely identical. The light oil above mentioned, the quantity of which is extremely small, is separated from the hydrate of phenyle by saturating it with an alkali and distilling the mixture in a glass retort with a gentle heat. In smell and properties it resembles benzine, and is most probably a mixture of benzine and cinnamene; unfortunately the quantity obtained was so small, that I was unable to subject it to more particular examination." (Stenhouse, *Phil. Mag.*, June, 1846.)

In *Journ. Soc. Chem. Ind.*, iv., 97, will be found a series of constants, by Mills and Muter, of bromine absorptions, for eight samples of *Xanthorrhœa* resin, comprising *X. hastilis*, *X. Preissii*, and possibly others.

PART III.—OTHER SPECIES OF *XANTHORRHŒA*.

XANTHORRHŒA ARBOREA, R.Br., B.Fl., vii., 115.

Found in New South Wales and Queensland. Monga, near Braidwood, N.S.W., 4th and 5th October, 1886.

This sample is in large concentric masses, consisting of the remains of leaves (*in situ*) cemented together with the resin, the resin usually being so abundantly in excess that large pieces of the pure substance are readily obtainable. The inner portion of these masses is a true mould of the caudex. Where the resin weathers it is seen to be of a liver-colour, but it readily fractures (in a very similar manner to gamboge), and shows a very bright fracture. The colour is pleasing, and I can only describe it as of a rich purplish-brown inclining to crimson. It is readily reducible to a fairly fine powder, which is of a dull burnt sienna-brown, admixed with a few dark particles. The powder possesses a faint aromatic odour, from which the lump appears quite free. It tastes slightly of benzoic acid.

It softens in boiling water, but does not appear to dissolve to any extent. It almost entirely dissolves in rectified spirit, forming a rich port wine-coloured liquid.

Petroleum spirit digested on the resin extracts .3 per cent of a yellowish resin destitute of odour. If the residue be digested in alcohol, 94.2 per cent. is dissolved out. This consists almost entirely of a deep orange-brown resin. As evaporation proceeds, a few minute needles of benzoic acid are observed to crystallize out, while the concentrated alcoholic liquid smells slightly of the same substance. But in no instance was the benzoic acid in anything like the comparative abundance in which it was obtained in the case of *X. hastilis*. Therefore, when only these two resins are in question, they may readily be distinguished (1) by their colour, (2) by the difference in quantity of benzoic acid.

The accidental impurity amounted to 5.5 per cent.

Neither of this nor of any other *Xanthorrhœa* resins did time permit me to make a qualitative examination of the resin; nor were the products of distillation inquired into.

Sample from Oatley's Grant, George's River, near Sydney.

Petroleum spirit extracts .3 per cent.

The effect of alcohol is the same as on the preceding sample. It extracted 89.8 per cent. The residue (9.9 per cent.) consisted of débris from the bases of the leaves, and no trace of free carbon could be detected by means of a lens. This observation is interesting in view of the statement I have made above (p. 430) to the effect that the darkening of *Xanthorrhœa* resin may be due to the presence of carbon after bush-fires. This particular sample was gathered by me from the midst of a freshly extinguished bush-fire, where everything was black and charred, and the resin, dug up almost from the surface of the ground, was black likewise. The resin is a little darker in tint than the other samples of *X. arborea*, both before and after treatment with alcohol, an effect which seems simply due to the heat alone, without admixture of carbon. Numerous other samples will require to be collected and examined before this point is settled.

Three different *Xanthorrhœa* resins were found by Hirschsohn to be incompletely soluble in chloroform and ether, but to dissolve completely in alcohol, the solution acquiring a brown-black colour with ferric chloride. "The solution of the acaroid resin is yellow,* and yields with lead acetate a precipitate, while the solutions of the other two resins are red, that of *X. quadrangulare* being not disturbed by acetate of lead, while that of *X. arborea* produces with the same reagent a turbidity; the chloroformic solution of the latter is yellow; that of the former colourless."

The specimen labelled *X. arborea* at page 148, Cat. Museum Pharm. Soc. (London), is *X. hastilis*, from the description of the resin given.

XANTHORRHŒA AUSTRALIS, R.Br., B.Fl., vii., 116.

Found in Tasmania and Victoria.

The shapes which the resins of the various species of *Xanthorrhœa* assume are quite accidental. Some of these forms are described under various species, and refer to specimens which have actually been examined. The resin of this species "is found in masses of irregular globular shape, within the body of the tree, and exuding in large tears and drops near its roots. It is a dark red friable substance, the purer homogeneous specimens exhibiting a most brilliant ruby colour when crushed into fragments; it fuses readily with the same deep colour, and exhales the characteristic odour of gum benzoin and dragon's blood under such circumstances. In many respects it resembles the last-named substance, but its solutions are less intensely red, inclining to yellow, while as a varnish it has much more body and gloss. It is very soluble in alcohol, and in the essential oils from the *Eucalypti*, that from the Dandenong Peppermint (*E. amygdalina*) proving an exception. Ether takes up a portion only, leaving behind a resinous substance coloured more intensely red than that which it dissolves; turpentine exercises no solvent action upon it, and the drying oils but very little" (*Report on Indigenous Vegetable Substances, Victorian Exhibition, 1861*).

* *X. hastilis* is evidently meant here.

XANTHORRHOEA PREISSII, Endl., B.Fl., vii., 117.

"Boro Blackboy."

Syn. *X. Drummondii*, Harv.

Found in Western Australia.

This grows from 20-30 feet high, and is said to produce more resin than any other Western species. From its tenacity, it is used by the natives in making their hatchets, hammers, &c., and in fixing the glass to their spears. They also are said to make from it a bright yellow paint, with which they smear their bodies.

This species is referred to in the following :—

"In 1854, Captain Wray, R.E., submitted a Report to the authorities of Western Australia on the manufacture of illuminating gas from grass-trees, at one-third the expense of lighting with oil and candles. The method of obtaining the material was as follows:—In the first instance, the leaves and resin were separated from the core by breaking up the plant with an axe, and sifting the resin from the leaves; but it was found by experience that as much gas was obtained from an equal weight of the leaves and resin together as from the resin alone. The quantity of resin obtained from an average "grass-tree" was about 45 lbs. weight. This was collected easily at the rate of 5 lbs. per hour by a person with an axe and sieve. The quantity of pure gas obtained was at least 4 cubic feet to the pound of resin and leaves; but much more might be obtained by a more complete apparatus. A cart-load of the plants, eight in number, weighed 1048 lbs. When the core was removed, the leaves and resin weighed 628 lbs. The core is very good fuel when mixed with other wood. The specific gravity of the gas is .888. The products of the distillation are gas, tar, and coke. The tar obtained was about one quart for every ten pounds, and this, when re-distilled, gave 8 per cent. of naphtha, and 20 per cent. of a sweet, spirituous, non-inflammable liquor. The coke remaining was about one-quarter the original weight, and with other fuel burns well. The coke of the leaf has a bright, shining appearance,

and when ground with oil is a very good substitute for lamp-black in paint. The gas has a smell somewhat similar to coal-gas, not nearly so offensive, but sufficiently strong to make any escape immediately perceptible. Its illuminating power appears to be very superior to coal-gas, and its light very white" (Quoted by Mr. P. L. Simmonds in *Journ. Soc. Arts*).

XANTHORRHOEA TATEANA, F.v.M., in Muell. Cens. Supp. 1, for 1885.

Kangaroo Island, South Australia.

Three years ago I received from Mr. J. E. Brown, the Conservator of Forests of South Australia (now Director-General of Forests of this Colony), the handsome resin of this new species. It is obtainable in large pieces free from woody matter. It is more or less vesicular. It breaks up and powders with the utmost facility. The fresh fracture is very bright, and of a rich pure ruby colour; the powder is dead, and of the colour of excellent chrome-orange. The colour of the lumps, originally of a ruby colour, becomes dulled by the friction of the masses against each other, and so becomes from liver-colour to chrome-orange.

Neither in lump nor in powder has the resin any odour at ordinary temperatures.

The finely-powdered substance gives up a little colour (yellow) to cold water, when digested in it. The colour appears to be most marked in this species, although in other *Xanthorrhoea* resins there is a trace of colour. When the water is heated, the resin melts and becomes of a blood-red colour, the liquid becoming turbid at the same time.

Petroleum spirit extracts ·1 per cent. of resin, which appears to be without colour, and is without odour. Rectified spirit dissolves the whole of the remainder (there is but a trace of impurity), forming a beautiful ruby-coloured liquid. Benzoic acid crystallizes out from the resin, and appears to be intermediate in quality between that yielded by *X. arborea* and *X. hastilis*, under similar circumstances.

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XANTHORRHŒA HASTILIS, R.Br.

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2. "On Botany Bay resin." Prof. Lichtenstein, in *Croll's Journal*, 1799, quoted by Dr. T. Thompson in *Chemistry of Organic Bodies (Vegetables)*, 1838.
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XANTHORRHŒA ARBOREA, R.Br.

1. "Volatile oil of Botany Bay resin." Trommsdorff. *Taschenberg* 1826, 9; *Gmelin*, xiv. 362.

XANTHORRHŒA SPP.

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2. "Notes on the *Xanthorrhœa* resins." J. M. Maisch. *Amer. Journ. Pharm.* May, 1881. *Journ. Pharm.* [3] xi. 1005.
3. "Acaroid resin." *Watts' Dict.* vi. 2.
4. "Paraoxybenzoic acid." *Watts' Dict.* vi. 898.
5. "Grass-tree gum." Simmonds. *Pharm. Journ.* [2] viii. 78.

A LARGE *EQUISETUM* FROM THE HAWKESBURY SANDSTONE.

BY R. ETHERIDGE, JUN.

(PALÆONTOLOGIST TO THE AUSTRALIAN MUSEUM, AND GEOLOGICAL
SURVEY OF NEW SOUTH WALES.)

(Plate xvii.)

At a Meeting of this Society, held on May 28th, Dr. J. C. Cox exhibited* a remarkably fine example of the basal portion of an Equisetaceous plant from the Hawkesbury Sandstone of North Shore, Port Jackson. It consists of eight internodes forming the obconical basal termination of the stem. As this peculiar reversed cone-like base occurs both in *Calamites* and *Equisetum*,† it becomes important to investigate the matter of its identity closer, especially as it has a strong bearing on the question of the age of the deposit.

The *Calamites* have a greater analogy with the *Equisetums* than with any other plants,‡ but are distinguished by possessing verticillate leaves entirely free, or confluent at their bases, and by the presence of clusters of sporangia similar to those of the *Lycopods*.§ In the *Equisetums*, on the other hand, the internodes of the stem are each terminated superiorly by a verticel of leaves united into a lobed or regularly dentate sheath,|| which is persistent,¶ and is

* Abstr. Proc. Linn. Soc. N. S. Wales, 28th May, 1890, p. iii.

† Schimper, *Traité Pal. Vég.*, 1869, I., p. 257.

‡ Grand 'Eury, *Flore Carb. Départ. de la Loire*, 1877, pt. 1, p. 12.

§ Schimper, *loc. cit.*, p. 291.

|| Schimper, *loc. cit.*, p. 255.

¶ Renault, *Cours Bot. Foss.*, 1882, pt. 2, p. 157.

one of the best means of recognising the genus. In the absence of any of these characters, however, differentiation between the genera is by no means easy. The same remark also applies to the genera *Phyllothea*, *Schizoneura*, at least to some extent, and perhaps to *Vertebraria* also. In the first-named there is a sheath similar to *Equisetum*, but it is prolonged into long linear leaves diverging from the stem in whorls. In *Schizoneura* we again meet with a sheath, and a "number of longitudinal leaflets with a central vein attached along their margins."* This sheath then undergoes a peculiar subdivision, which need not be further referred to. As regards *Vertebraria*, the peculiarities of its stem at once distinguish it.

The portion of the stem now before us is six inches long, and in its present compressed state nearly four in width, tapering at the lower or distal end to an obtuse point. Within the length of the specimen there are eight internodes, the foremost but one, and best preserved, being nearly one and a-half inches long. The lower or distal internodes are half an inch long. The rate of decrease of the stem is but gradual, and the amount of curvature very little. The nodes are now represented by narrow impressed lines of a dark colour, and here and there are interrupted in their course by oval cicatrice-like scars. The vertical costæ, or ribs, are narrow, now merely dark coloured lines, usually about one-sixteenth of an inch apart, and invariably opposite on contiguous internodes.

So far as I am aware the genus *Calamites* has not been met with in the Permo-Carboniferous Coal Measures of N. S. Wales at all, nor is it satisfactorily known from the associated Marine beds, although the late Prof. de Koninck recorded † *C. varians*, Germar, as occurring in N. S. Wales, but without definite locality.

Calamites has certainly never been obtained from any of our higher Secondary beds. Nor, am I aware of any recorded occur-

* Feistmantel, Pal. Indica, Gondwana Flora, 1890, iii, No. 2, pt. 1, p. 59.

† Foss. Pal. Nouv. Galles du Sud, 1877, pt. 3, p. 142.

rence of *Equisetum* either in the Permo-Carboniferous Coal Measures, or Hawkesbury-Wianamatta Series of this Colony. But two species are known from the Mesozoic plant-beds of Queensland—*E. rotiferum*, Ten. Woods, and *E. (?) latum*, Ten. Woods.* The balance of evidence, therefore, from this point of view, would lead to the belief that our specimen is an *Equisetum*, and, in such a case, it is the first reliable record of the presence of this genus in our Hawkesbury Sandstone.

With regard to the specimen itself, the general appearance reminds one more of the finely costate *Equisetums* of the Continental Trias than of the coarser-ribbed Palæozoic *Calamites*; compare, for instance, the figure of *Equisetum Mougeotti*, given by Schimper,† from the Grès-bigarré of the Vosges. I suspect, however, that the nearest ally will be found in *E. (?) latum*, Ten. Woods, from Rosewood, near Rockhampton. This plant is described‡ as having a finely-ribbed stem, with internodes three inches high, and the ribs about twenty to the inch. The ribs in our fossil are somewhat less, about fifteen. There is nothing to prevent the internodes in the Hawkesbury fossil from lengthening out to the measurement of *E. (?) latum*, judging from the rapid increase which certainly takes place in this direction in the specimen under description. The Mining and Geological Museum contains specimens of a large *Equisetum*, collected by Mr. Soutter, from the Esk Valley, forty-six miles W.N.W. of Ipswich, Queensland, and presented by him. In a specimen now before me, two internodes measure seven and a-half inches in length, and both imperfect, the upper being four and three-quarter inches long. The greatest compressed breadth is three inches. The riblets are finer than those of our Hawkesbury specimen, and more numerous in a given space.

* Proc. Linn. Soc. N. S. Wales, 1883, viii., pt. 1, pp. 66 and 87.

† Schimper, *loc. cit.*, Atlas, t. 12, f. 4.

‡ Proc. Linn. Soc. N. S. Wales, 1883, viii., pt. 1, p. 87, t. 2, f. 1.

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In the mean time, rather than coin a new name for this fossil, it will be better to provisionally regard it as *E. latum*, Ten. Woods.

The scars noticeable at some of the nodes are probably those left by rootlets, similar to those figured by Schimper in *Calamites*.*

I am indebted to Dr. J. C. Cox's kindness for an opportunity of noticing this very interesting plant.

EXPLANATION OF PLATE.

Basal portion of the decorticated stem of an *Equisetum* from the Hawkesbury Sandstone of North Shore, Port Jackson.

* Schimper, *loc. cit.*, Atlas, t. 13, f. A and B.

ARABIAN NEMATODES.

BY N. A. COBB.

In the winter of 1888-9, I collected, among other things, on the coast of Arabia, about two hundred marine Nematodes, an examination of which discovers seven specific forms. The marine Nematodes hitherto studied, those of Carter excepted, have been taken from European branches of the Atlantic Ocean, *i.e.*, the Baltic, North and Mediterranean Seas. It is therefore of interest to find that all the species in my Arabian collection can be referred to known genera inhabiting Atlantic waters. I afterwards observed some of these forms living on coasts of the Southern and of the Pacific Oceans, as well as on other coasts of the Indian Ocean. The geographical range is therefore roughly indicated. Various structural facts here recorded will, I think, be found of interest by those familiar with the Nematode anatomy.

METHODS.

Nematodes are to be sought (1) among marine and fresh-water algæ, (2) in sand and mud at the bottom of water not too stagnant, (3) in moist earth especially about the roots of plants, (4) on and in the higher plants, and (5) in the greatest variety of animals, where either as facultative or obligate parasites they are often the cause of specific diseases of the most serious kind.

In the hope of stimulating yet closer examination into the structure and life-histories of the free-living Nematodes by showing how easily and in what super-abundance the necessary material may be obtained, I detail here the methods I have found useful. These methods apply to a host of other minute organisms, all less frequently studied than they would be if better ways of securing and investigating them were known.

The principle underlying my process of collecting free-living Nematodes is one long practised by prospectors. I prospect for Nematodes in the same way that a miner prospects for gold. Suppose, for instance, that the sand of some beach or fresh-water stream is inhabited, as often happens, by Nematodes and other minute organisms. To quickly isolate these little animals in great numbers the collector has only to profit by the fact, that in standing water sand sinks at once, while small organisms sink rather slowly. Put half a pound of the sand with a pint of water into a dish of the form and size of an ordinary one-quart fruit-tin. Having a second beaker or fruit-tin at hand empty, pour the water and sand rapidly back and forth until the water is well roiled—then suddenly stop. The sand at once sinks to the bottom of the dish, but the organisms remain for a few seconds partially suspended. The instant the sand reaches the bottom of the dish, pour the supernatant fluid containing the organisms into a third dish and there let it stand until clear, when the sediment of organisms may be obtained in a very satisfactory state by decanting the clear water.

To collect from mud, reverse the process; that is to say, after agitating the mud and water allow the roily mixture to stand until the *organisms* have settled, then pour away the muddy water. Repeat this process until the desired result is obtained.

In collecting from algæ it will be found best to use a large shallow dish. Place the algæ in the dish with an abundance of water. To separate the Nematodes from the algæ, stir the latter briskly about in the water, squeezing them often, and finally wring them dry and throw them away. Allow the washings to stand for a quarter of an hour, and then decant. Put the sediment into deep dishes, and treat as directed for sand or mud, or both, as may be necessary.

To collect from culms of grasses or sedges or from other land plants, cut a quantity of the plants and put them into a wash-tub and cover them with water. Allow them to soak an hour, then proceed as with algæ.

The sediment obtained by any of the above operations consists of Nematodes and numerous other small organisms, along with dead matter of about the same specific gravity. This sediment is placed, a teaspoonful at a time, in a shallow glass dish three to four inches in diameter, containing about half an inch of water, and the Nematodes are captured by transmitted light under a magnifying glass with a fine-pointed medicine-dropper. I make my own medicine-droppers, as I find the boughten ones have points too large for my purposes.

If the animals are to be studied in a living state, they may be rendered motionless by adding a little chloral hydrate solution to the water in which they are to be examined. The action of the chloral hydrate is simply narcotic. The animals recover, and may afterwards be killed and preserved by any process desired. I believe this method is due to Davaine. If glycerine preparations are to be made, kill with osmic acid of $\frac{1}{100}$ to $\frac{1}{10}$ per cent. Allow the worms to remain in the acid until their original whiteness or transparency becomes a trifle clouded. The first slight cloudiness is the signal for transferring to water and starting the preparations on their road to glycerine by way of the differentiator. The results are good, especially if warm but weak osmic acid is used.

For the very finest histological as well as coarser anatomical studies I have devised the following method, which gives far better results than any other with which I am acquainted:—On capturing a worm with the medicine-dropper, I eject it forcibly into 20 cc. of concentrated solution of corrosive sublimate, kept at 50°-60° Centigrade by floating it in a porcelain dish on the surface of hot water. If the sublimate solution is much hotter than 60° the bodies of some species burst. The worms should remain in the hot sublimate solution at least an hour, better longer. When a sufficient number of worms has been captured, pour the sublimate solution, worms and all, into a flat glass dish placed on a black background, and pick out the worms with the aid of a magnifying glass and a fine-pointed medicine-dropper, and put them into the prepared object-box of a differentiator. Stain and

bring into balsam by means of the differentiator. Most of the smaller species stain readily in borax carmine, which is one of the best of stains for this work. *Oxyuris vermicularis* (adults, not the young) and a number of other parasitic species, however, do not stain in borax carmine. Mayer's carmine rarely fails to stain these exceptional species. Overstaining is corrected by adding hydrochloric acid to the proper differentiator fluids. *I can recommend this method very highly, not only for Anguillulidæ, but also for numerous other groups of the smaller animals and plants.*

FORMULA.

I intend to describe in a series of papers, of which this is one of the first, a large number of hitherto unknown Nematodes. In order to bring the characterizations into small compass, and thus gain space for the fuller discussion of such morphological, physiological, and pathological problems as may present themselves, I shall make use of a new formula which expresses briefly and accurately the necessary measurements.

Inasmuch as this formula will occur once or twice in the description of each species, and be made to bear such a large share of the burden of characterization as to become, in a systematic sense, a prime factor in the work, it merits at the outset a full elucidation.

Since the middle of the present century nematelmithologists have shown an ever-increasing regard to absolute and relative dimensions. Dujardin (1846) gave the length, the ratio between the length and breadth, and occasionally other dimensions, such as the length of the tail and the position of the vulva. No one did more than this until Eberth and Bastian, working simultaneously on the Anguillulidæ, saw the necessity for further particularization. These two investigators, the one in Germany, and especially the other in England, laid firm the foundation of the important superstructure afterwards raised by Bütschli, Marion, De Man, Von Linstow and others. The appearance of their works (Eb. 1863, Bast. 1866) marks an era in the history of our knowledge of the group of which they treated. Their texts were accompanied by

accurate and well executed figures of both extremities of each worm described. The dimensions given, based sometimes it is true on too few or otherwise too imperfect measurements, related to the length, breadth, position of the vulva, depth of the buccal cavity, and the fraction of the entire length occupied by the tail and œsophagus respectively. To these Bastian added the dimensions of the spicula and striæ. The English author, making the inch his unit of length, contented himself with giving a categorical list of the measurements made. Thus, taking a species at random, *Enoplus pigmentosus* was entered as $\frac{1}{3} \times \frac{1}{100}$; teeth, $\frac{1}{888}$; œsophagus, about $\frac{1}{7}$ (i.e., of the total length); tail, $\frac{1}{180}$. This is manifestly not very convenient for the reader. The German author, making the millimeter his unit of length, followed the same plan as his English contemporary but gave fewer measurements, trusting no doubt that the exquisite figures accompanying his text would supply all necessary information concerning details. Bütschli, the renowned Heidelberg naturalist, followed (1873-4) the plan adopted by Bastian and Eberth, but brought to his aid a greater amount of pictorial art. His illustrations are full length portraits, accompanied by figures on a larger scale, the latter illustrating the details of the head, tail, &c. Marion (1873) furnished no new ideas to the nomenclaturist. De Man, however, has introduced decided improvements in nomenclature. Realizing the necessity for exactitude and completeness in the matter of measurements, this author, who has described a greater number of new forms than any of his predecessors in the same field, and added also very essentially to our knowledge of the Nematode anatomy in general, has adopted a series of ratios by which a considerable number of measurements are expressed very concisely. These ratios he represents by the Greek letters α , β , γ ,—his α being the ratio of the length to the median (greatest) diameter, β the ratio of the total length to the length of the œsophagus, and γ the ratio of the total length to the length of the tail. Thus, after having given the absolute length, he is enabled to give three remaining dimensions by means of such an expression as the following: $\alpha = 45$, $\beta = 5$, $\gamma = 8$.

The formula which I now propose points out, by means of eleven numbers, eleven dimensions, and serves at the same time to indicate the sex from which the measurements were taken, as well as the general form and size of the sexual organs. The following are my formulæ for a species of *Oncholaimus* :—

Female.					Male.				
1·	8·2	17·2	52·	93·3	·8	8·	16·6	M	94·1
·9	1·5	1·6	1·7	·8	·8	1·3	1·4	14	·8

The formula for the male is distinguished from that of the female by the use of the letter M, for reasons presently to be stated. In order to exhibit in as graphic manner as possible the nature of this new formula, I have desired the printer to set up the above formula for the female in special type as follows :—

	Pharynx.	Nerve-ring.	Base of Neck.	Vulva.	Anus.
Lengths	1·	8·2	17·3	52·	93·3
Diameters	·9	1·5	1·6	1·7	·8

1·77 mm.

The numbers above the horizontal line relate to longitudinal measurements, while those below it relate to diametral measurements. The first number above the line (1·) represents the distance from the anterior extremity of the animal to the bottom of the pharynx or buccal cavity. The first number below the line (·9) represents the length of the body-diameter which passes through the base of the pharynx. The second number above the line (8·2) represents the distance from the anterior extremity of the animal to the centre of the nerve-ring; and the number directly below (1·5) represents the length of the corresponding diameter, i.e., the body-diameter passing through the nerve-ring. The third pair of numbers (17·3 and 1·6) represent measurements relating to the posterior end of the œsophagus or base of the neck. In other words, 17·3 is the distance from the anterior extremity of the animal to the posterior end of the œsophagus, or is the length of the neck including the head; and 1·6 is the diameter of the body at the point where the œsophagus joins the intestine, i.e., where the neck joins the body. Finally, 52 and 93·3 are the distances from the anterior extremity to the vulva and anus respectively.

and 1.7 and .8 are the lengths of the corresponding diameters. It will be seen that the different dimensions are taken up in the formula in a natural order. Reading the formula from left to right reads off the dimensions of the animal from head to tail. Now comes the peculiarity of the formula: *The unit of measurement is not absolute but relative*, is, in fact, nothing else than the hundredth part of the length of the worm itself. In other words, the measurements are expressed as percentages of the total length of the animal. Thus, the first measurement (1.) indicates that the depth, i.e., the length, of the pharynx is equal to 1 per cent. of the total length of the body. So the measurements for the base of the neck indicate that the length of the neck is equal to 17.3 per cent. of the body-length, while the length of the diameter at the base of the neck is equal to 1.6 per cent. of the body-length. The absolute length of the animal expressed in millimeters is placed at the right. In the present case that length is 1.77 millimeters.* In the formula for males the measurements relating to the vulva of the female are replaced by measurements relating to the middle of the body. The fourth number above the line becomes, therefore, always 50, and is indicated by M. The number below M gives the diameter of the male at the middle. In other respects the formula for the male is similar to that for the female.

Unless otherwise stated all measurements must be understood to be taken from adult specimens as they appear in profile.

By the use of certain signs the fourth term above the line may be made to convey an idea of the form and size, as well as the

* Dividing 1.77 millimeters by one hundred, we obtain the unit of length used in the remainder of the formula. The result is .0177 millimeters. If it is desired to obtain the absolute length of the pharynx, neck, or other part, multiply the proper measurement by this coefficient (.0177). This gives for the absolute length of the pharynx $.0177 \times 1 = .0177$ millimeters, and for the length of the neck $.0877 \times 17.3 = .3$ millimeters. It is well known, however, that absolute dimensions, in such a case, are of very little consequence, while relative dimensions are of the greatest importance, and the great advantage possessed by such a formula as that now under consideration is that relative dimensions are made prominent.

position, of the sexual organs. The female genital organs lie either on one or both sides of the vulva, and the branches are either straight or reflexed. Letting a hyphen represent a straight, and a quotation mark a reflexed branch, we have—

- 52·1- indicates two straight branches, one on either side of the vulva.
- '52·1' indicates two reflexed branches, one on either side of the vulva.
- 52·1- indicates one straight branch behind the vulva.
- 52·1' indicates one reflexed branch behind the vulva.
- 52·1 indicates one straight branch in front of the vulva.
- '52·1 indicates one reflexed branch in front of the vulva.

In case of the male—

- M- indicates two straight testicles extending in opposite directions.
- M indicates one straight testicle extending forwards.
- M- indicates one straight testicle extending backwards.
- M' indicates one reflexed testicle extending backwards.
- 'M indicates one reflexed testicle extending forwards.

It should be borne in mind that the marks in the case of the male refer exclusively to the form and position of the testicle proper, that is to say, that portion of the generative apparatus beyond the *vas deferens*. When two testicles are present their limits are easily defined, for the point where they join marks the beginning of the *vas deferens*. When but a single testicle exists it is marked off from the *vas deferens* by a constriction in the same way that the *vas deferens* is marked off from the *ductus ejaculatorius*.

The percentage of the body occupied by the sexual organs is indicated by superior or reference figures placed at the right of and above the fourth term. Thus '50'³⁰ represents a female sexual apparatus whose vulva is central, and whose symmetrically reflexed branches occupy 30% of the length of the body.

One may quickly familiarize himself with this new formula by imagining that the horizontal line represents the animal under consideration, and that the dimensions are written alongside, opposite the proper parts,—that is, opposite the base of the pharynx, the nerve-ring, the base of the neck, the vulva, and the anus.

Being already familiar with the use of this formula, I am not a proper judge of the difficulties that would occur to a novice in its use. To me the most obvious difficulty is that of having always to consider the anus with reference to its distance from the anterior instead of, as is usual, from the posterior extremity, a difficulty which should disappear with a little practice. It is much easier to enumerate what seem to me the advantages of the formula.

- (1.) The position of each number indicates the dimension to which it refers. The formula is thus brief, yet concise.
- (2.) The position of the nerve-ring is indicated. In properly prepared specimens the position of the nerve-ring is clearly to be seen, so there is no longer any reason why the position of so important an organ should not be entered among the characteristics. In order to see at once the relative position occupied by the nerve-ring, comparison should be made between the second and third numbers above the line. It will be thus seen that in the species whose formula has been given, the ring is situated a little in front of the middle of the neck.
- (3.) A glance along the lower line of the formula reveals at once the general form of the body. The worm whose formula has been given has a somewhat cylindrical body. The portion of the neck in front of the nerve-ring tapers considerably. The body also tapers considerably in front of the anus. This latter is patent from comparison of $\cdot 8$ with $52\cdot 1$. The vulva is central, which means that the sexual organs are probably double and symmetrical. Therefore the body would not be likely to diminish much in size in the immediate vicinity of the vulva. Hence the decrease in size ($1\cdot 7$ to $\cdot 8$) must take place considerably behind the vulva, and therefore near the anus. In very plump worms the largest of the numbers below the line may rise as high as 10, in slender ones become less than unity.

- (4.) By averaging the specific formulæ of a genus, we may obtain a generic formula. During phylogenetic and systematic studies the specific and generic formulæ greatly facilitate the necessary comparisons.

I hope by the aid of this new formula to be able to describe such species as belong to already well known genera, even without the aid of illustrations, so accurately as to leave little to be desired, and yet so briefly as to leave space for the full discussion of biological and economic problems.

ONCHOLAIMUS, Duj.

O. ORIENTALIS, Cobb.* $\frac{16}{13} \frac{8}{17} \frac{173}{2} \frac{76.4}{21} \frac{249}{12}$ 30 mm. Submedian hairs, so inconspicuous as to escape observation under ordinary magnification, may be found throughout the length of the body by use of the highest powers. The cuticula is not striated. To the convex-conoid anterior half of the neck succeeds a somewhat compressed head, which is rounded in front, and bears, well forward, a row of six slender setæ. The six large and thin lips form a kind of dome over the pharyngeal cavity, their free extremities appearing, however, never to meet. Each lip therefore approximates in shape to an isosceles spherical triangle. Chitinous thickenings strengthen the margins of each lip, and from the apex a movable incurved hair or flap projects forward and inward. About a dozen minute nuclei occur near each point where two adjacent lips join each other at the base,—nuclei very much smaller than those found elsewhere in the body, being in fact scarcely larger than the oesophageal pigment granules. Doubtless these nuclei appertain to the muscles and nerves which govern the lips. I saw no papillæ around the mouth. The nearly circular lateral organs, one-fifth as wide as the head, are most conspicuous when the animal is seen from above or below; they then appear like two oblique lateral pockets opposite to or a little behind the middle of the pharynx. There are no eye spots, but granules of brownish pigment, arranged in radial lines, are abundant in the anterior half of the œsophagus,

* Cobb, "The Differentiator." Sydney, 1889.

especially at the base of the pharynx. This last is two-thirds as wide as deep, and bears a small dorsal tooth behind the middle, and two large sub-equal or equal submedian teeth, each of which extends about three-fourths the distance to the lips and there ends (opposite the bases of the cephalic setæ) in a sharp perforated point. Anteriorly the œsophagus is one-third as wide as the neck, excepting, of course, where it swells to receive the base of the pharynx; posteriorly it becomes one-half as wide as the neck. The cardiac collum is distinct but not conspicuous, and the cardia itself large. There is no very distinct cardiac cavity. The intestine is one-half as wide as the body. Though it often contains diatoms, I do not think the species exclusively diatomivorous. The narrow duct of the ventral gland terminates in a small ellipsoidal ampulla, which empties through the porus excretorius half-way between the base of the pharynx and the nerve-ring. The nerve-ring is nearly as wide as the œsophagus at the point encircled, and is but a trifle oblique. Near it, both behind and in front of it, I have often seen a few large and transparent cells, from some of which one or more processes passing into the adjacent tissue could be observed. Doubtless they were nerve-cells. They occur in the dorsal and lateral regions, but I do not mean by this statement to imply that they do not equally occur in the ventral region. At least as many as eight such cells may occur in the neighbourhood of the ring.

Four distinct unicellular lateral organs lying between the œsophagus and the body-wall occur near the nerve-ring, two behind and two in front of it. These organs seem to me especially interesting, and I shall describe them somewhat minutely. The two posterior of the four organs are removed from the nerve-ring a distance about equal to their own length, but they are not exactly opposite each other, the one on the right hand side being nearer the ring than that on the left hand side. The two anterior organs are even less symmetrically placed. The one nearest the ring, the right, is about as far in front of the ring as the left posterior one is behind it. The more remote anterior one, the left, is twice as far from the ring as that just described. Thus it

will be seen that these four organs are not very symmetrically placed. In other respects however they are much alike. Each is an ellipsoidal unicellular body about one third as wide as the adjacent part of the oesophagus and two thirds as wide as long. Each has one nucleolated nucleus lying in the midst of the granular contents, and each is connected from its anterior portion with the exterior by an exceedingly fine but perfectly distinct short duct which passes quite through the cuticula. The interpretation which these structures seem to call for is this: Each is a unicellular gland. I must however relate certain circumstances which cause me to be doubtful about the completeness of my observations. In the first place I have thus far observed these organs distinctly in one specimen only, a young female. In this specimen however they are so perfectly stained by carmine as to be extremely conspicuous. No other among the half dozen of this species in my Aden collection permits me to see these organs very plainly. Nevertheless I can see one or more in all of them more or less distinctly, and do not doubt the existence of at least four in each. I cannot tell why only one individual out of a half dozen of the same species treated alike should alone have taken the stain so as to show these organs. In the second place, therefore, I cannot be certain that not more than four of these organs exist in each individual; for of course the same circumstances which caused the one individual alone to so stain as to show these organs may in a like manner have caused only part of the organs in that individual itself to have taken the stain, but I do not think this very probable. After a careful search I have failed to discover more than the four, but I must add that I have made observations on species of other genera which make me believe that a series of lateral organs, each connected with the exterior, sometimes extends throughout the length of the worm. It only remains to add to this rather lengthy description of these four organs that they are quite distinct from each other.

The female sexual apparatus is asymmetrical. From the rather inconspicuous vulva the muscular vagina leads forward into the uterus, which commonly contains one to four eggs, each having a

breadth four-ninths as great as its length, this latter being twice as great as the width of the body. The reflexed ovary joins the uterus at a point as far in front of the vulva as the anus is behind it, and extends thence backwards, past the vulva, apparently to near the anus. The anterior half of the tail is concave-conoid, the diameter of the posterior cylindrical half being only one-fifth as great as the anal diameter. The terminus is distinctly swollen, and gives exit to the secretion of the rather small caudal glands.

$\frac{1.6}{1.2} \frac{7.5}{1.2} \frac{16.9}{2} \frac{21.0}{2.1} \frac{94.8}{1.4} 3.52 \text{ mm.}$ The tail of the male is like that of the female. The two narrowly linear, nearly straight, equal spicula, one-third as long as the tail, are almost imperceptibly arcuate in the distal half. Seen in profile, they appear to lie at an angle of 30° with the axis of the body. Their proximæ are not sufficiently contrasted with the shafts to be distinct. The two equal testicles occupy the middle half of the body. About ten hairs stand opposite the distal half of the spicula.

Hab.—This species is common on the coasts of the Northern Indian Ocean. I found it abundant in sand and among algæ on the coasts of Arabia, Ceylon, &c. Individuals of both sexes were mature in February.

O. ANGUSTATUS, Cobb*. $\frac{1}{8} \frac{8.2}{1.5} \frac{17.2}{1.5} \frac{52.35}{1.7} \frac{98.2}{8} 1.77 \text{ mm.}$ Nor is this species striated. The only conspicuous setæ are the six short ones which surround the head opposite the apex of the longest pharyngeal tooth. The anterior half of the neck is convex-conoid. The head is slightly constricted just behind the setæ, and this gives rise to a comparatively distinct labial region. Circular lateral organs probably exist opposite the base of the pharynx. This latter is nearly as wide as deep and bears three teeth, two of them only half as long as the third (the right submedian), which reaches nearly to the six lamelliform lips. These latter are of the form described for the preceding species. The œsophagus is two thirds as wide as the neck and presents at its posterior extremity a rather indistinct cardiac collum. The narrow duct of the ventral

* Cobb, "The Differentiator." Sydney, 1889.

gland terminates in a small ellipsoidal ampulla which empties through the porus excretorius a little behind the nerve-ring (9.5%). The nerve-ring is as wide as the œsophagus and oblique. The tail is concave-conoid from in front of the inconspicuous anus. The terminus is slightly swollen, having a diameter nearly one half as great as the anal diameter and giving exit to the secretion of the anal glands. The female sexual organs are double and symmetrically reflexed, occupying at least 35% of the length of the body. From the inconspicuous vulva the vagina leads to the two-parted uterus, either branch of which contains two eggs each about three fourths as wide as the body and four or five times as long as wide.

$\frac{7}{12} \frac{8}{13} \frac{10}{14} \frac{M}{15} \frac{24}{16} \frac{1}{17} 1.25 \text{ mm.}$ Tail unlike that of the female inasmuch as it diminishes rapidly from a little in front of the anus, especially on the ventral side,—the anterior eighth being thus somewhat conoid. Then follows a slight but sudden swelling most prominent on the ventral surface. Thence to the slightly swollen terminus the tail is uniformly one third as wide as at the anus. The two equal slender spicula, almost half as long as the tail, are of nearly uniform size throughout and arcuate only in the distal third and there but slightly. Proximæ slightly swollen. Of the three pairs of papillæ one is pre-anal, opposite the arcuate portion of the spicula, and the remaining two are post-anal, the smaller being near the anus and the larger being situated in the depression in front of the swelling on the tail.

Hab.—Adults of both sexes are common in sand on the beaches of Arabia during the winter months.

O. EXILIS, Cobb.* Female unknown.

$\frac{1}{12} \frac{7}{13} \frac{13}{14} \frac{M}{14} \frac{22}{15} \frac{1}{16} 2.16 \text{ mm.}$ The distinctly compressed head, succeeding to a conoid neck, is somewhat rounded in front and bears ten setæ, one dorsal, one ventral, and four double submedian. The food, passing the six triangular flap-like lips, enters a pharynx nearly as wide as deep. The two smaller pharyngeal teeth reach half way to the mouth, being only two thirds as long as the

* Cobb, "The Differentiator." Sydney, 1889.

remaining one, the left submedian. The two circular lateral organs are situated opposite the lower part of the pharynx, which they equal in width. No eye spots exist, but an abundance of brown pigment is found in the head and neck. The pharynx, two-thirds as wide as deep, bears three teeth—one, the left submedian, reaching nearly to the lips, the remaining two, being only half as long. The œsophagus is swollen to receive the pharynx, then diminishes and becomes uniformly about one third as wide as the neck, until gradually swelling in the posterior fourth to more than twice that width. Cardiac collum distinct. Intestine two-thirds as wide as the body. The ventral gland, lying somewhat behind the cardiac region, empties,—by means of a long and very narrow duct and small ellipsoidal ampulla,—through a porus excretorius situated twice as far behind the base of the pharynx as the latter is behind the lips. The ventrally arcuate tail is conoid, but tapers more rapidly in the anterior than in the posterior half. It bears a number of hairs. Terminus somewhat swollen, its diameter one-fourth as great as the anal diameter. Tail glands present. The two equal, linear, nearly straight spicula scarcely exceed the anal diameter in length. Seen in profile, they seem to lie at an angle of 45° with the axis of the body. Their proximæ are scarcely enlarged. Four pairs of bristle-bearing submedian papillæ stand opposite the spicula. The anterior third of the tail is armed with three similar pairs. The two equal testicles occupy the middle third of the body.

Hab.—Beach sand ; Aden, Arabia. Mature in February.

MONHYSTERA, Bastian.

M. MAS-PAPILLATUS, n.sp. $\frac{.6 \ 87 \ 193 \ .648 \ 89}{1.3 \ 19 \ 22 \ 26 \ 17}$ 1.50 mm. Cuticula finely striated. To the convex-conoid neck succeeds, somewhat in front of the two circular lateral organs, a distinctly expanded head, which is rounded in front, and bears six long setæ but no papillæ. These setæ are situated opposite the middle of the unarmed, gaping, cyathiform pharynx, two of them being lateral and four submedian. The lateral organs are one-third as wide as the head,

and are placed behind the pharynx at a distance from it equal to the width of the head. The whole middle third of the œsophagus is of uniform diameter, being less than half as wide as the neck; in the anterior third it expands very gradually to the pharynx; in the posterior third it expands rapidly in diameter, becoming widest (two-thirds as wide as the neck) in the seventh eighth, and diminishing thence to the distinct cardiac collum. A three-lipped cardia projects into the distinct but small cardiac cavity. The intestine is two-thirds as wide as the body. The narrow rectum is a trifle longer than the anal diameter. The nerve-ring, making an angle of 60° with the axis of the body, is wider than the œsophagus at the point encircled. Nerve-cells are abundant on both sides of the nerve-ring. I saw no ventral gland. The tail is conoid or convex-conoid from the inconspicuous anus, and contains three unicellular caudal glands placed in a longitudinal row behind the anus. Of these glands the posterior is the smallest: all empty as usual at the terminus. A vagina shorter than the diameter of the body leads forward from the inconspicuous vulva into the single uterus, which contains three or four ellipsoidal eggs one and one-half times as long as the body is wide, and half as wide as long. From the uterus the straight ovary extends forward to near the cardiac collum.

♂ 92 191 .M 87.2 1.30 mm. Tail of the male like that of the female. The two equal, linear, uniformly arcuate spicula are of nearly the same size throughout, and are twisted so that when exerted they project to the right and left, or even in a posterior direction. Their proximæ are small and cephalated by constriction. Accessory pieces two, joined, exerted with the spicula, at least when the animal is killed with chemicals. The ductus ejaculatorius is longer than the œsophagus; from it the straight testicle extends forward and ends just behind the cardiac region. The species is characterised by the ventral row of six to seven very small equidistant papillæ, which exists on the male in front of the anus. The hindermost of these papillæ is opposite the proximal ends of the spicula, and the foremost is about as far from the anus as is

the end of the tail. Each papilla is the orifice of a minute one-celled gland.

Hab. —Adults of both sexes are equally common in beach sand between tide-marks on the coast of Arabia during the winter months.

HYPODONTOLAIMUS, De Man.

H. ARABICUS, n.sp. Female unknown.

$\frac{5 \ 11.3 \ 18 \ M \ 87.4}{16 \ 2.4 \ 2.3 \ 2.5 \ 2.5}$ mm. The naked cuticula bears about 450 transverse striæ, resolvable by means of the higher powers of the microscope into rows of elongated dots. The neck does not narrow very perceptibly until near the head, which is truncate and destitute of both setæ and lips. Twelve papillæ surround the mouth. I saw no lateral organs but do not assert their non-existence. There are no eye-spots. The shallow cyathiform pharynx seems to bear at its base a ventral and a dorsal tooth. The œsophagus is somewhat phalangiform, the larger and longer swelling being not that which receives the pharynx but that which forms the posterior termination. The central third of the œsophagus is only one-fourth as wide as the neck. The cardiac collum is shallow but distinct. A unicellular ventral gland nearly one-third as long as the œsophagus lies in the ventral part of the body cavity, just behind the cardiac region. It is unusually large, being one-half as wide as the intestine, and empties its product through a short duct which appears to terminate in a porus excretorius opposite to or near the cardiac collum. The nerve ring is as wide as the œsophagus at the point encircled and slightly oblique. The lateral fields are one-fourth to one-third as wide as the body. The ventrally arcuate tail is conoid to the conical terminus, which has a diameter one-fourth as great as the anal diameter, and gives exit to the secretion of three unicellular caudal glands situated opposite the anus. The two equal elongated cuneiform spicula have a length equal to that of the anal diameter. The proximæ are not cephalated. The two accessory pieces are three-fourths as long as the spicula, and are probably joined together distally. The generative apparatus extends to in front of

the middle of the body. I saw no papillæ either pre- or post-anal.

Hab.—Marine sand, Aden, Arabia.

DESMODORA, De Man.

D. NUDICAPITATA, n.sp. $\frac{3}{2} \frac{74}{19} \frac{122}{19} \frac{40 \cdot 8}{26} \frac{80}{16} \frac{87}{16}$ mm. The thick and naked cuticula displays about 700 conspicuous transverse striæ resolvable with the highest power into rows of fine longitudinal markings. These striæ are not apparent on the head, but begin 0·8% of the length behind the mouth, the head thus acquiring a naked appearance, which is heightened by the absence of cephalic setæ and papillæ. The neck diminishes most rapidly in the anterior third where it is convex-conoid. The rounded naked head, bearing the lateral organs, is continuous with the neck and presents in front a small, simple, shallow depression, the pharynx, which has the form natural to three rounded lips not shutting closely together. The œsophagus is only one third as wide as the neck but expands at both ends especially the posterior where it forms a somewhat indistinct ellipsoidal or pyriform bulb as long as the neck is wide. There is a distinct cardiac collum. The intestine is not so wide as the bulb of the œsophagus. The nerve-ring is as broad as the œsophagus at the point encircled and scarcely at all oblique. Nerve-cells are abundant and conspicuous. Tail conoid to near the end, where it is half as wide as at the anus, then in the final tenth convex-conoid to a point. Caudal glands are present. The female sexual organs are double and symmetrical, occupying about 30% of the length of the body. The projecting vulva is connected by the vagina with the two branches of the uterus each of which is in turn connected with a reflexed ovary, reaching one half to two thirds the way back to the vulva and containing about eight developing ova. Eggs probably half as wide as the body, and three times as long as wide.

$\frac{2}{8} \frac{8}{16} \frac{15}{17} \frac{M}{18} \frac{80 \cdot 7}{17}$ mm. The tail of the male resembles that of the female in all respects. The two equal, linear, arcuate or

boomerang-shaped spicula are of uniform size throughout and their length is one and one half times as great as that of the anal diameter. The two accessory pieces, joined distally, are parallel to and one half as long as the spicula and are protruded with them to a certain extent. No ventral papillæ.

Hab.—Adults of both sexes were apparently equally common in beach sand between tide-marks, at Aden, Arabia, in February.

SPILOPHORA, Bastian.

S. CEYLONENSIS, n.sp. Female unknown.

$\frac{13}{13} \frac{9.5}{24} \frac{18}{8} \frac{M}{32} \frac{87}{26} 1.7$ mm. The cuticula bears hairs, striæ (375 in all) and dots similar to those already described and figured by Dr. De Man for his *S. paradoxa*. To the conoid neck succeeds a truncated head whose lip region, presenting ten or twelve obscure papillæ, is set off by a constriction situated opposite the apex of the single dorsal pharyngeal tooth. From the depths of this constriction spring the four slender cephalic setæ, which are one half as long as the head is wide. I saw no lateral organs. An indistinct pharyngeal bulb receives the pharynx, which is anteriorly rather cyathiform. Posteriorly the œsophagus expands into a large elongated-pyriform double bulb nearly one third as long as the entire neck. This bulb is separated by a triple-chambered internal cavity,—containing nuclear matter that stains strongly,—into two parts, one in front of the other, each of which contains a distinct elongated chitinous structure. That portion of the œsophagus in front of the posterior bulb is not of uniform diameter but averages one fourth as wide as the neck. The nerve-ring is nearly as wide as the œsophagus at the point encircled and is not at all oblique. The intestine is attached to the centre of the rather flattened posterior surface of the cardiac bulb and is at first very narrow. Its rather thin walls are composed of cells containing coarse granules of a brownish colour. These cells are of such a size that three build the circumference of the intestine. I discovered nothing concerning the ventral gland. The tail is nearly conical, being in reality slightly concave. The two linear spicula are

equal and arcuate. They are one and one half times as long as the anal diameter and not of uniform breadth, presenting noticeable irregularities. Their proximal ends are not cephaloid. The two lamelliform accessory pieces are two thirds as long as the spicula. The single testicle, one half as wide as the body, and hardly as long as the œsophagus, is directed forwards, only its free extremity being reflexed. In its anterior fourth are found the mother-cells of the spermatozoa. Their diameter nearly equals the width of two of the striæ of the cuticula. These mother-cells are granular and stain strongly. In the succeeding fourth of the testicle the mother-cells give rise to the true spermatozoa which fill the posterior half of the testicle. These are spherical cells whose diameter is slightly greater than the width of one of the striæ, and whose nuclei only can be stained, at least with carmine. It will be seen that this organ has a double function. It is at once testicle and vas-deferens. The ductus ejaculatorius is composed of two rows of cells, the first ten or twelve pairs being larger than the others and of a different structure.

Hab.—Found among algæ and in the sand at their roots on the coasts of Arabia and Ceylon. The males were mature in February.

ADDITIONAL NOTES ON *PERIPATUS LEUCKARTI*.

BY J. J. FLETCHER, M.A., B.Sc.

In the *Proceedings of the Royal Society of Victoria* for 1889 (p. 50) Mr. Dendy gives an account of all the Victorian specimens of *P. leuckarti* which had up to that time come under his notice, and he summarises all that was known about the species. I propose now to supplement Mr. Dendy's paper by some account of about forty specimens obtained, since I last had occasion to offer any remarks on the subject, from three new localities in New South Wales, viz., Mt. Kosciusko, the Blue Mts., and Dunoon on the Richmond River.

The specimens exhibit some variety in pattern and coloration independent of size or sex (as far as the material goes), but from the constant presence of fifteen pairs of walking legs (the legs of each individual have been counted), the presence of an accessory tooth at the base of the main tooth of the outer blades of the jaws, &c., I can only regard them as referable to one and the same species.

I also take occasion to record the occurrence of the species in Tasmania, Mr. Masters in looking through the invertebrates in the Macleay Museum having recently found a rather bleached specimen with fifteen pairs of walking legs which must have been in the collection for at least ten years.

Specimens from Mount Kosciusko.

Thirty-five (18 ♂'s, 17 ♀'s) specimens in the collection of the Australian Museum have been examined. They were obtained by Mr. R. Helms in March, 1889, while on a collecting expedition for the Museum, and were exhibited at the July Meeting of this

Society by Dr. Ramsay who subsequently by kind permission of the Trustees allowed me to examine them. In his "Report of a Collecting Trip to Mt. Kosciusko"* Mr. Helms refers to these specimens in the following words: "But perhaps the most interesting contribution to my collection was made on Sunday, March 10th, in the shape of a specimen of *Peripatus*. This interesting find was later on augmented by two others, and one specimen was obtained on the 19th at an elevation of at least 5700 feet. This is the highest altitude at which I have met this interesting Myriapod, and as far as I am aware none have been previously found at such an elevation. It must be remembered that this locality for at least from four to five months [in the year] is frequently covered with several feet of snow. During my stay there I experienced several frosty nights. After a few rough and cold nights, which made insects scarce, I shifted on the 23rd to a well sheltered place called Wilson's Valley, at an altitude of about 5000 feet and stayed there for the remainder of my time. Being favoured with exceptionally fine weather for the time of the year, I was lucky enough to obtain in this locality many fine insects, . . . and the greater number of the *Peripatus* was also obtained here, but only one variety which I did not get amongst the four specimens from the higher altitude."

Apart from the fact that this is the largest number of specimens yet obtained in any one locality, and from their occurrence at high altitudes, the collection is interesting for an usually large proportion (about 50 per cent.) of males the characters of which will be referred to later on.

Before Mr. Helms's visit it would certainly not have occurred to everyone that under existing conditions Mt. Kosciusko was an unusually favourable neighbourhood in which to look for *Peripatus*; but bearing in mind the archaic characters of *Peripatus*, and what the geologists tell us of the probability that "the eastern portion of the continent during the Lower Tertiary Period must have been submerged to the extent of about 4000 feet below its present level

* Records of Aust. Mus., Vol. I., No. 1, p. 11.

leaving only the higher parts of the Cordillera standing out as a chain of islands which have probably never been wholly submerged since the commencement of the Mesozoic era, and whereon have survived the Cycads, Araucaria, and other ancient vegetable forms which now abound in Australia ; the living *Ceratodus* of Queensland and the Marsupialia also point to the same conclusion,"* one need hardly be surprised to find *Peripatus* here even as an aboriginal inhabitant and not merely a recent immigrant from lower levels, or, remembering that *Peripatus* though chiefly tropical or sub-tropical yet occurs in New Zealand, should also be able to maintain itself here in spite of the bleakness and winter snows of Mt. Kosciusko.

The specimens form a series in which at first blue is the predominant colour, red (or its equivalent orange or yellow) being present only in an infinitesimal amount, but the latter by gradational increments finally gains the ascendancy, largely but not altogether displacing the blue, and giving rise to an unusually distinct pattern of longitudinal stripes. For convenience they may be considered in four groups, but there are again also slight gradational forms among the specimens in groups (b) and (c), and the passage from group (c) to (d) is a little more abrupt than in the case of the others.

(a) To the naked eye appearing dark blue. Antennæ blue. A median longitudinal intensely dark blue linear stripe with a fine microscopic longitudinal sometimes interrupted line free from pigment down the middle of it ; the rest of the dorsal surface except for some pale-coloured primary papillæ in more or less longitudinal series, and the outer surface of most of the legs except for some minute patches of orange in the ground colour of some of them, a dull dark indigo blue due to the presence of dark blue papillæ on a slightly paler blue ground colour ; the ventral surface of the body and of the legs even to the naked eye of a noticeably paler blue, the papillæ on the former especially being further

* C. S. Wilkinson, " Notes on the Geology of N.S.W." (1887), p. 53.

apart, and the ground colour paler, in places sometimes colourless. The pale-coloured papillæ are pale blue or more or less colourless, wholly so, or all but an apical portion, or only a basal portion, with usually just an apical pale spot; when conspicuous they are seen to be chiefly arranged in four longitudinal series on each side of the median dorsal line; though not so conspicuous as in the forms in which there is relatively more orange, they are generally recognisable, and their arrangement is as follows:—(1) on either side of and rather close to the median dorsal line commencing on the head a row the papillæ of which are separated by intervals of three transverse ridges; usually in addition between the first row and the median line an inner row of similar papillæ commencing some little way behind the first, the papillæ of which also occur at intervals of three ridges, and alternating with the former, a ridge on which there are chiefly secondary papillæ intervening between every two alternating papillæ; if most of the papillæ are uniformly pale there is then a double or alternating row of them, but sometimes the papillæ in only one row, or in parts of the body are pale; (2) still further out on each side a similar double (or single) alternating series; one of these rows quite anteriorly bending in towards the first-mentioned row; the papillæ of this, of the preceding, and of the next series, when present, on the same transverse ridge; (3) again still further out on each side a more interrupted series consisting generally of two papillæ, one behind the other, over each leg; and (4) a series of irregular lozenge-shaped groups (in outline) of about half a dozen or more papillæ (one or two papillæ on each of about six consecutive ridges) just above the intervals between the legs: some only of the papillæ in some of the lozenge-shaped groups show a tinge of orange or yellow, the others being pale blue, while sometimes the papillæ of a whole group are dark blue; orange may also be present in one or two very small patches on the ground colour of the outer surface of a few of the legs towards their base. These specimens therefore are almost entirely blue, and though not one of them is absolutely without at least a tinge of orange somewhere in one or other of

the situations named when examined in a strong light, yet it is excessively small in amount.

Three specimens.

(b) In general appearance like the foregoing ; for though there is in these a not inconsiderable addition of orange (or yellow) it is so inconspicuous, occurring in very small and for the most part isolated areas, as to be almost inappreciable by the naked eye. This additional amount of orange makes its appearance on (1) the basal portions of some of the pale papillæ ; (2) in the ground colour of the alternate ridges bearing chiefly secondary papillæ ; and (3) in the ground colour of the legs. Not on all the papillæ, however, either in the lozenge-shaped patches or elsewhere is orange present ; some in both cases are still obviously pale blue. On the dorsal surface orange is present round the bases of some of the secondary dark blue papillæ on the ridges which alternate with those bearing the pale primary papillæ, either as a small ring, or it may encroach a little more so as occasionally to join the similarly coloured area of a contiguous papilla, but considerable patches are not formed as in specimens in which there is relatively still more orange ; not all the papillæ on a given ridge however have orange round their bases, though quite a number with orange may occur consecutively, and the number of secondary papillæ so modified is greater than the number of pale papillæ on the alternate ridges ; an increased amount of orange is not so noticeable towards the extremities of the body as in the intervening region. The orange on the legs is very noticeable, the patches being somewhat larger, more numerous, and more of the legs show them.

Fourteen specimens.

(c) Orange or red is present in sufficient quantity to be readily perceptible to the naked eye, and to give something like a definite pattern ; the difference between these and the foregoing ones being due to the increased amount of red with a corresponding increase in warmth of tint which affects both the papillæ and the ground colour, and in addition the antennæ and the ventral surface also ;

and the extremities, especially the tail. Antennæ showing red on some of the basal rings, and on an occasional distal one. The longitudinal rows of papillæ very distinct, not only the ground colour surrounding their bases but the papillæ themselves in most cases now distinctly red; much red about caudal end; on the alternate ridges with small papillæ many of the latter also are red, and in the ground colour red has also increased in amount to such an extent that for a considerable distance on a given ridge the entire surface (both papillæ and ground colour), may be entirely red, such a red patch at length alternating with a blue patch (both papillæ and ground colour blue), red predominates on either side of the mid-dorsal line for some distance, then blue between this and the series of lozenge-shaped patches, but alternate light and dark bands are not otherwise indicated; the lozenge-shaped patches are now very distinct, usually the whole patch (not merely the outline), papillæ as well as ground colour, red. The legs show an arrangement of alternating rows of blue papillæ and orange papillæ, the same tints alternating in the ground colour. On the ventral surface there is a considerable increase in the amount of orange, the ventral surface generally in consequence appearing paler than in the preceding groups, many of the primary papillæ together with the immediately surrounding area orange, the ground colour largely blue more particularly on either side of a rather broad median paler band in which orange predominates (and in which are included the pale areas to be mentioned subsequently).

Fifteen specimens.

(d) Antennæ almost entirely blue; red papillæ on a few of the basal rings, a few specks of red elsewhere, and some red between some of the antennal rings. A well-defined median dorsal longitudinal linear dark blue stripe, bordered on either side by a rather broad longitudinal red band; each of these bordered externally by a similar dark blue longitudinal band of nearly equal width; beyond each of these another longitudinal red band like the first, its outer margin reaching the bases of the legs; the bands are broadest in the middle region of the body, and taper a little

towards the extremities: the intervals between the legs form another interrupted longitudinal band with a predominance of blue. The pattern as described above is readily visible to the naked eye, the arrangement of the bands and their well-defined character being very striking. Under the microscope it is seen that there are a few blue-tipped papillæ and little dark bits of ground colour in the red bands, and papillæ with red bases in the blue bands; and that the bands are not quite so perfectly defined, or their margins quite so straight as they appear to the naked eye. On the legs the ground colour is blue, the papillæ chiefly red with more or less of the apical portion blue. On the undersurface there are chiefly red papillæ with blue ground colour, but with the red on the bases of the papillæ invading the blue in places, and with an indication of pattern as follows: a median ventral interrupted series of rather broad irregular patches corresponding with the intervals between the consecutive pairs of legs blue (primary papillæ are few or absent here), bordered on either side by an area in which are red primary papillæ and irregular blotches of ground colour with scattered patches of blue ground colour; in the median ventral line between the legs of each pair there is a series of blotches of red, in which are the pale areas to be referred to later on; thus up the median line there is a series of alternating irregular blue and red patches, bordered on either side by an area in which the two colours occur together, red primary papillæ with more or less of surrounding ground colour red being present with patches of blue ground colour and a few blue secondary papillæ; the whole ventral surface might be described as mottled. The inner surface of the legs shows chiefly red papillæ as before on a blue ground colour; the spinous pads and the foot blue; a little patch of red proximally on the outer side of foot.

Two specimens.

Specimens from the Blue Mts.

Two specimens, one found by Mr. A. G. Hamilton, who most generously gave me his specimen, under a stone at Govett's Leap,

the other by myself under a log by the road-side near Wentworth Falls. These are the first specimens recorded from the Blue Mts., though several of us for some years have been on the look out for it. I have myself on previous occasions looked within a few feet of the exact spot on which I found my specimen which was the only one I could find after prolonged and careful search, and Mr. Hamilton fared no better. The bush fires prevalent during the dry season of 1888-89 have doubtless not diminished the difficulty of finding specimens.

(a) A very dark specimen, to the naked eye when alive almost dull black, but in a good light a median dorsal longitudinal linear intensely dark stripe, and scattered light coloured papillæ, more particularly light blue ones were visible. Under the microscope or lens there are visible intensely dark blue papillæ so dark as to be almost black, dark papillæ with the basal portion red, pale blue papillæ with sometimes the basal portion red, and dull brick or rusty red papillæ, variously arranged on a dark background, lighter than the darkest blue papillæ and not or only slightly invaded by red: the light blue papillæ occur in two single rows on each side of the dorsal mid-line corresponding with the outer row of each of the two dorsal zig zag rows in the first three groups of the Mt. Kosciusko specimens, and in two lateral rows rather close together above the bases of the legs; the papillæ of each of these rows are closer together than in the case of the dorsal rows, and they are not so straight as the latter; with a few red papillæ they are all that represent the third or dorso-lateral row, and the lozenge-shaped patches above the intervals between the bases of the legs; on the alternate ridges are some secondary red papillæ, but there is little or no red in the ground colour. On the legs the first ridge shows a good deal of red, but the rest of the outer surface exhibits dark papillæ with fewer red papillæ on a dark ground colour. The undersurface to the naked eye is as usual much paler; the majority of primary papillæ are wholly red, of the smaller ones blue, the ground colour blue, the general effect produced being mottled but without any definite pattern; the inner surface of the legs much

like the ventral surface; about the head there is a marked predominance of blue papillæ; about the caudal extremity there is an admixture of red ones with blue ones. Antennæ dark blue without any red.

One specimen (♀) alive and at rest about 20 mm.; crawling about 30; after drowning 28 mm.

(b) A red specimen longitudinally striped with very dark blue. Antennæ to the naked eye appear nearly uniformly dark, but with much very inconspicuous red on the rings except the distal ones. A median linear longitudinal very dark, almost black, stripe visible to the naked eye; the rest of the dorsal surface on each side of this line divided into three longitudinal bands, of which two are brick red, these being separated by an intervening imperfect dark band; the general pattern is thus very similar to that of group (d) from Mt. Kosciusko, but with the outer dorsal dark band on each side not so well defined and more incomplete; in the red bands the papillæ are with few exceptions entirely red with here and there a patch of dark ground colour; in the dark bands many of them have their bases red, and more and larger patches of ground colour are dark rendering the bands somewhat diffuse and patchy; in the intervals between the bases of the legs of each side as on the outer surface of the legs there is again red mixed with darker papillæ and patches of ground colour, but with red predominant, in this respect differing from the longitudinally striped Mt. Kosciusko examples, in which on the legs externally blue is predominant. Undersurface paler than dorsal surface; chiefly red, with a few dark papillæ and specks or patches of similar ground colour; about the head there are more dark papillæ than elsewhere.

One specimen (♀) alive and at rest 15 mm.; crawling about 21 mm.; after drowning about 33 mm.

In this specimen we get a maximum of red not only in regard to the papillæ but also the ground colour. It agrees in many respects with the redder of two specimens obtained in Nov., 1888,

at Burrawang [*vide* P.L.S.N.S.W. III. (2), p. 1560]; in that specimen however the longitudinal striping was not so marked, the median dorsal longitudinal linear dark stripe was nodose as in Illawarra specimens, each enlargement being bordered on either side by a sub-triangular red patch, the outer dark dorsal bands are indicated by a series of patches, the red bands have more dark tint in them (dark-tipped papillæ and specks of dark ground colour).

Specimens from Dunoon, Richmond River.

During a month's collecting, the weather being more or less unfavourable during greater part of the time, Mr. Helms obtained for me six specimens, of which one disappeared in course of transit. I received three living and two spirit specimens.

The light coloured antennæ of these specimens at once attract attention. The body to the naked eye appears dark brown; there is a good deal of red (or in some it is rather ochreous) which is chiefly confined to the papillæ, but most of the primary papillæ now show it (except the apical portion); while the blue is intensely dark. The dorsal surface on each side of the median longitudinal linear intensely dark stripe in two of the specimens (♂) when alive showed indications of three fairly defined longitudinal stripes, the first one with more dull rusty or ochreous-red in it appearing reddish-brown, then a darker brown band, then again a lighter band like the first, the difference being due to the prevalence in the lighter bands of papillæ with red bases, the red of which sometimes invades the ground colour, while in the darker bands there are more wholly dark papillæ; in the third specimen (♀) when alive the greater part of the dorsal surface was more uniformly tinted like the dark bands in the other two, though the outer light bands were indicated; lozenge-shaped patches are not very well defined apart from the outer lighter band. The outer surface of the legs like the dark portion of dorsal surface. The ventral surface of the body as usual paler than the upper surface, mottled with blue and red but usually the blue predominates in the median line corresponding with the intervals between the consecutive legs, and

about the head; the inner surface of the legs like the ventral surface; the spinous pads blue; a considerable patch of red externally at the bases of the feet. The antennæ are almost entirely red, dusky at the base and near the tips and sometimes on the under surface, but the red predominates.

Two specimens (♂) crawling about 24 mm.; one (♀) crawling 44 mm., after death in corrosive sublimate 23 mm.

From the examination of the above specimens the following considerations seem to follow: (1) the prevalent colours are indigo blue and red, either of which may predominate, the former passing into black in some specimens and the latter into orange or yellow: (2) there is a median longitudinal dark (*i.e.*, blue or its equivalent) linear stripe running down the back in the middle of which is a fine microscopic sometimes interrupted line free from dark pigment: (3) the pattern on the rest of the dorsal surface is a more or less satisfactory indication of light and dark longitudinal stripes, most conspicuous in specimens with a maximum of red.

As regards colour the blue is brighter and more striking in the specimens from Mt. Kosciusko than in any others I have seen. They present some differences in detail in regard to the intensity of the prevailing blue tint both in different specimens and sometimes in different parts of the body in the same specimen, more especially on the ventral surface; such differences are probably in some measure due to the action of the spirit; as spirit exerts a considerable amount of bleaching power on both blue and red. During life they were all probably darker in colour than they are now.

The median longitudinal dorsal dark linear stripe is without the nodose character so common in Illawarra specimens in which it is very striking when the rest of the dorsal surface is not very dark. Down the middle of it there seems to be in all cases a very fine sometimes interrupted microscopic line free from pigment. This of course is only another way of speaking of it as a light or white line edged with black. I prefer the former because the

dark line, especially in specimens with a maximum of red, is conspicuous to the naked eye whereas the light line is microscopic; moreover as far as my experience goes it is more conspicuous after the animal has been placed in spirit, and I have seen living specimens in which in parts of the body it seemed to be wanting or obscured by pigment; but even in spirit specimens it is possible to find cases in which it is absent on some of the ridges.

As regards pattern the differences between the Victorian specimens examined by Mr. Dendy and the specimens examined by me are more marked than in the case of the colour. Mr. Dendy says (*l.c.* p. 61): "There is a thin median light line down the dorsal surface. The characteristic pattern on the remainder of the dorsal surface is a series of segmentally-arranged diamond-shaped patches, in which the red colour is predominant. In some cases viz., the darkest specimens these patches are represented only by a row of small, light coloured, yellow or red spots on each side of the middle line. Each of these spots is situate in the position of the apex of each triangular half of one of the characteristic diamond-shaped patches found in other specimens." I have seen only one Victorian specimen, my original one from Gippsland, which since it had been dead for at least a week (fortunately in dry cold weather) before I received and put it into alcohol is not in first-rate condition; nevertheless in places it still shows fairly well a series of dorsal segmentally-arranged diamond-shaped patches just as Mr. Dendy describes. I have, however, never seen a specimen from this colony with a similar pattern. Those that come nearest to it are the ordinary specimens from Illawarra, but in these the median longitudinal linear dark stripe is nodosa, or presents a series of enlargements, one to each pair of legs, and on each side of each of them is a small triangular or diamond-shaped patch of red, while laterally just above and corresponding with the intervals between the legs on each side of the body is a series of diamond-shaped patches of red, which seem to be absent in Victorian specimens. Hence it seems to me that while the statement that "the characteristic pattern on the rest of the dorsal

surface is a series of segmentally-arranged patches in which the red colour is predominant" may be given as a character of the species as it occurs in Victoria, it does not apply to the species without qualification. Mr. Tryon speaking of Queensland specimens says "the colour is very dark blue, almost black, with a few rust-like specks here and there, and lighter coloured beneath; or dark fuscous, with a still darker line along the back." Three very dark specimens given by Mr. Tryon to Dr. Haswell, which I have had the opportunity of examining, may be briefly described as follows:—

As in the dark specimen from the Blue Mts. the red is entirely, or almost so, confined to the papillæ; one shows primary papillæ (the basal or all but an apical portion) red on ridges alternating with others on which there are more numerous secondary papillæ frequently entirely red, a number of them often occurring consecutively, with indicated but not very well defined lozenge-shaped patches above the intervals between the legs: a second has fewer secondary papillæ red; while the third has extremely little red anywhere, and may very well be described in Mr. Tryon's words as "very dark blue, almost black, with a few rust-like specks here and there." Hence though in these there is certainly no very striking indication of a pattern of longitudinal stripes, neither do I see that such light coloured papillæ as are present represent, or have any relation to, segmentally-arranged diamond-shaped patches.

It seems to me, therefore, no longer doubtful that constant specific characters are not derivable from the pattern and coloration of *P. leuckarti*; and it is worthy of note how, as more material comes to hand, specimens from widely distant areas sometimes are found to present characteristic variations in these particulars, whereas specimens from almost the same spot in other localities may exhibit almost the extremes of variation, though it is possible that in such cases bigger series of specimens would give gradational forms also.

When preparing his Monograph Mr. Sedgwick had for examination only two specimens of *P. leuckarti*, one of each sex, both of

them much contracted and with the feet bent ventrally, making satisfactory investigation difficult. He was however able to make out in the male the presence of "a rounded white papilla on the ventral face of the fifteenth leg, on each side of the genital opening."

Mr. Dendy out of thirteen specimens met with only one male, not a very satisfactory specimen, and he also speaks of the presence of a small white papilla on the ventral surface of each leg of the last pair.

On examining the specimens now in review it soon became probable that the collection contained an unusually large proportion of males, though what I took to be such had not precisely the characters mentioned by Sedgwick and Dendy; that is to say I was able to pick out a number of specimens, all of them small, with not prominent genital papillæ, and with papillæ, generally whitish, on the ventral surface of some or all of the legs, with the exception of those of the first pair, but not merely on the legs of the last pair only. And this state of things I found to obtain not only in specimens from Mt. Kosciusko and Dunoon, but also in three specimens from Queensland lent me by Dr. Haswell who received them from Mr. Tryon, and in one from Illawarra given me by Mr. A. G. Hamilton. The presence or absence of papillæ seems to be a matter of little importance. In some specimens they are recognisable on all the legs with the exception of those of the first pair; in others only on some of these; the first two pairs (on the second and third pairs of legs) are generally quite conspicuous, as also are those on the posterior seven or eight pairs of legs with the exception of the last pair; the legs on which they most frequently appear to be wanting or on which it is most difficult to identify papillæ or pores, if present, are the 4th and 5th and one or two succeeding pairs, and the 15th pair; sometimes they are not equally conspicuous on both legs of the same pair; in the male of group (d) from Mt. Kosciusko unusually large papillæ are present on each leg of the posterior nine pairs except the first and last leg but one on one side of the body on which they are rela-

tively insignificant, while on legs in front of the seventh pair neither papillæ nor pores are visible; in one specimen the legs of several pairs have each two papillæ, one above the other; sometimes the appearance of a papilla is exaggerated by the proximal portion of the duct of the crural gland being slightly everted; but I have never yet seen a specimen in which papillæ were present only on the legs of the last pair. Not all the legs even of the same specimen are equally favourable for examination, but in well preserved specimens even when papillæ are not recognisable the apertures of the ducts of the crural glands sometimes are.

The papillæ are round, usually whitish but sometimes not different in colour from the surroundings, slightly post-axial in position, and are situated near the base of the leg slightly external to the nephridiopore. Mr. Sedgwick says: "It (the papilla) is in the same position with regard to the leg as the corresponding structure in the Cape males." (Monograph, Q.J.M.S. XXVIII, p. 464), *i. e.*, "on the second row of papillæ counting from the innermost pad" (*l. c.* p. 448). In the specimens examined by me the papillæ are located nearer the base of the leg than this, on about the fifth-seventh row of papillæ above the innermost pad (*i. e.* about the third or fourth ridge below the nephridiopore); I have never seen them so close to the pad as the second row.

As was to be anticipated sections showed crural glands to be present; and as in *P. capensis** each crural gland consists of a dilated vesicular portion placed in the lateral compartment of the body cavity in the leg, and of a narrow duct opening to the exterior, on one of the papillæ in question. As some of the specimens show papillæ on all the legs but those of the first pair, it is a reasonable inference that in the males of *P. leuckarti* a crural gland may normally be present in each leg but those of the first pair. On the other hand the presence of two papillæ on some of the individual legs in one specimen, together with the occasional absence of both papillæ and pores [as in the last pair of legs of each of two males of which sections were cut] shows

* Memorial Edition of Balfour's Works, Vol. I. p. 905.

that as in *P. Edwardsi* these organs, whose function is unknown, are liable to some variability.

In the females papillæ are not present; nevertheless in this sex it is not an uncommon occurrence to find on most of the legs pale, frequently somewhat curved, slit-like pits or depressions commencing just beyond about the second papilla-bearing ridge below the nephridiopore and crossing the next one or two ridges; occasionally some of them look very like pores. Their appearance, their position (fairly corresponding in this respect with the papillæ of the males), and their number (for they may be visible on all the legs but those of the first pair) naturally suggest the possibility at least of rudiments or relics of crural glands. At present I can offer no evidence in favour of such a supposition as in a number of sections comprising portions of two females no crural glands such as occur in the males were present, nor could I find any trace of them.

Though I have had plenty of material to look at, I have not had enough for purposes of dissection and section-cutting to make out these and other details; and the series of sections of two males and two females at my disposal, partly from the condition of the material and partly from the want of suitable laboratory appliances are not complete, and in some respects leave a good deal to be desired.

In *P. capensis* the crural gland of each leg of the last pair is enormously enlarged and prolonged forward as a long tubular gland, seen in section lying above the nerve cord in each lateral compartment. My two males were chosen at random chiefly because they were less bent than usual, and as it happens each of them is without crural glands in the last pair of legs; but one of them has the glands of the fourteenth pair of legs enlarged, and in the other two pairs are enlarged, those of the thirteenth and fourteenth pairs.

As in *P. novae-zealandiae* nephridia are not present in the legs of the last pair

Of the (spirit) specimens from Mt. Kosciusko some are variously bent making it difficult to measure them ; allowing for this as nearly as possible they may be said to vary in length from about 9-18 mm., not including the antennæ ; with two exceptions the smaller ones are males, which average about 10 mm. long, the two largest being about 13 and 14 mm. respectively ; the two young females however are easily distinguishable from the males by the characters of the genital papilla and aperture, and the absence of papillæ on the legs. Of the five specimens from Dunoon two females were, apart from their greater size, similarly readily distinguishable from three males.

The genital papilla of the female is very frequently remarkably prominent (more especially post-mortem) and bears a longitudinally disposed slit ; in the large dark specimen from the Blue Mts. however, as occasionally happens, the genital papilla is not relatively more prominent than is usual in the males. In the latter each lip of the otherwise longitudinal slit is usually notched, so that the aperture appears cruciform, and with a conspicuous large and one or two smaller blue papillæ in each re-entering angle generally visible in favourably preserved specimens gives a very characteristic appearance. In addition to the three differential sexual characters in respect of size, the characters of the genital papilla and aperture, and the occurrence of papillæ on certain of the legs, which have already been mentioned, and which were first pointed out by Mr. Sedgwick, I am able now to mention another in the occurrence in the males of a pair of pores, sometimes slightly crescentic in shape, one on either side of and close to the median ventral line between the genital papilla and the anus but nearer the latter ; I do not at present know the significance of these pores as my sections are not good enough to enable me to follow them up ; possibly they may be the openings of the ducts of accessory glands. I do not know of any other external differences characteristic of the sexes.

On the ventral surface is a median series of pale areas which seem pretty constantly present (though they are not visible in one

specimen from Illawarra). There is one of such areas between the legs of each pair except the last, but more frequently in addition there is a second one in front of each of these. They are sometimes larger than at others, but they occur in both sexes. They are placed chiefly in the furrows but the paleness extends also on to the ridges. Mr. Dendy calls attention to them, and Saenger also evidently noticed them for fig. 31 of Pl. XIII., illustrating his paper is a figure showing a ventral view of so much of the hinder portion of the body as includes the last two pairs of legs, and a reference line marked *gm* points to what is evidently intended for the pale area between the legs of the last pair but one. The explanation of the figure is in Russian, but Professor Stephens has kindly translated that portion of it relating to *gm* as "bare spots observable between each pair feet in medial line." I am unable at present to throw any light upon the subject of their import.

DESCRIPTIONS OF A NEW GENUS AND TWO NEW
SPECIES OF *TENTHREDINIDÆ*.

BY WALTER W. FROGGATT.

The saw-flies for which the following genus is proposed are nearest allied to the well-known genus *Pterygophorus*, of Klug, having long many-jointed antennæ, and somewhat similarly shaped wings, but are very unlike in other details.

They are inhabitants of the tropical scrubs of the northern parts of N. S. Wales and Queensland. The first species was taken by me at Cairns, N. Queensland, when collecting for Sir William Macleay in June, 1886. The second is in the Macleay collection with a label "Australasia." I have recently been enabled to find its locality and describe the female, from several specimens of the female and one male, collected by Mr. R. Helms at the Richmond River in the beginning of this winter.

PHILOMASTIX, n.g.

Antennæ 18-jointed in both sexes; ♂. 1st and 2nd joints short, obconical, the 3rd-18th infundibuliform, the 3rd twice the length of the 4th, the rest progressively decreasing in length, the 18th rounded at apex, and slightly constricted in the middle; ♀. 1st joint obconical, twice the length of 2nd, which is very short, 3rd long, twice the length of 4th, 4th-17th more elongate viewed from above, from below more serrate, last two joints forming a papilli-form club, the last joint slightly constricted in the middle. Head twice as wide as long, but not as wide as thorax; eyes large and prominent; clypeus large, not incised; labrum of moderate size, rounded at apex; mandibles with one subapical tooth. Thorax large, rounded in front, channelled in the centre, and at both sides

of mesothorax. Legs moderately thick and long, all the tibiae armed with two spurs at the extremity, and the intermediate and hind ones with another spur on the outer edge, about two-thirds from the base. Abdomen short; in the ♂ constricted at the base; in the ♀ short and thick, the posterior segments short, and raised higher than the base; the saw lance-shaped, with broad teeth on both sides. Wings: forewings long, one large marginal cell not appendiculate, with four submarginal cells, 1st very small, elongate, oval; the transverse cubital nervure with a bulla at its apex, which partly obliterates it; 2nd submarginal elongate, rounded at its base, a little longer than the 3rd submarginal; the latter broadest at apex; 2nd discoidal cell long and narrow, broadest at base; lanceolate cell rather diamond-shaped, petiolated, and with a bulla on either side where the transverse veins join the anal nervure: hindwings moderate; inner cubital cell broadest at apex, the transverse cubital vein nearly straight, middle cell wanting.

(1) *PHILOMASTIX NANCARROWI*, n.sp.

♀. Body, 5 lines; expanse of wings, 13 lines; antennæ, 3 lines long.

Ochreous, marked with black; centre of abdomen steel blue. Head ochreous, ocelli testaceous, eyes dark brown, clypeus pale yellow, shining, with a few shallow scattered punctures, ferruginous at apex; labrum pale yellow; mandibles black; mouth parts and palpi hirsute; first two joints of antennæ black, the remainder pale ochreous. Thorax rounded in front, pronotum shining, an impressed line in centre of mesothorax, the two lateral lobes containing a black patch on either side; the scutellum shining, rounded behind; metathorax small; thorax beneath smoke-coloured. Legs: fore and intermediate legs and coxæ pale castaneous, tibiae and tarsi blue-black; hind legs, coxæ, and base of femora sordid ochreous, the remainder blue-black; all the legs covered with a silvery pubescence. Abdomen: first two segments sordid ochreous, the following bright steel blue, the blue running back in a V-shaped point into the posterior segments, which are

sordid ochreous, covered with little castaneous-coloured spots. Wings ferruginous clouded, darkest in the centre, with the exception of the marginal cell, which is almost clear; stigma ochreous, nervures black.

Hab.—Cairns, N. Queensland. Named in honour of my late friend, R. H. Nancarrow, of Sandhurst, Victoria, a most enthusiastic naturalist, who first called my attention to Australian Hymenoptera.

(2) *PHILOMASTIX GLABRA*, n.sp.

♂. Body, $5\frac{1}{2}$ lines; expanse of wings, 12 lines; antennæ, 3 lines.

♀. Body, 7 lines; expanse of wings, $16\frac{1}{2}$ lines; antennæ, 5 lines.

Ochreous, marked with black; abdomen blue-black, with sordid ochreous markings. ♂. Head and first two joints of antennæ black; the base of head behind the eyes, clypeus, labrum, and rest of antennæ bright fulvous, mandibles castaneous. Thorax, pronotum, and below the wings yellow, rest of thorax blue-black; scutellum shining, impressed in the centre, legs castaneous, with the exception of the coxæ and base of femora, which are sordid ochreous. Abdomen: basal half of first segment steel blue, apical half of first and $\frac{2}{3}$ of second segment sordid ochreous, forming an irregular band round abdomen, narrowest in centre of back; apical portion of 2nd and rest of abdominal segments steel blue, the outer edges of last three and margin of anal segment bright fulvous, beneath the apical edge of each segment marked with fulvous, the marks broader towards the posterior. ♀. Head shining ochreous, first two joints of antennæ, eyes, and tip of the mandibles black, clypeus and mouth parts hairy. Thorax large, ochreous, marked with black in the centre and on either side, below smoky; scutellum bright ferruginous, slightly impressed in the centre; legs shining steel blue, except the base of hind femora and coxæ, legs with a silvery pubescence. Abdomen bright blue, black above and below, a faint line at the apex of first segment, a stripe curving upwards, broadest below, on the sides of the second segment, and various markings at the base of the following segments, which are

often broad and extending into each other, the posterior segments above broadly margined with sordid ochreous, but the underside steel blue. Wings: forewings, basal half pale ferruginous, apical half darker; the base of the marginal, the whole of the 1st and half of the 2nd submarginal, part of the 1st discoidal, and part of the lanceolate cell clouded with fuscous, forming a wedge-shaped band across the forewings: hindwings pale fulvous.

Hab.—♂. Australasia; ♂ and ♀. Dunoon, Richmond River, N.S.W.

NOTES AND EXHIBITS.

Rev. J. Milne Curran exhibited—(1) Dick and Swift's Patent Petrological Microscope, in which the rock-slice under examination remains fixed, while the nicols rotate. The polarizer and analyser are connected by toothed wheels, so that they can be turned together either crossed, inclined, or parallel. Lenses are provided to bring interference figures into the eyepieces. The instrument was much admired by the members present, and seems to be a great advance on the Petrological Microscopes of the old type. (2) Photographs to illustrate various points of geological interest in Western and Central New South Wales, one series showing the peculiar effect of river erosion on slate and granite rocks, at the junction of both, on the Macquarie. (3) Photographs showing the peculiar weathering of "Granitoid" rocks near Nymagee, in what is known locally as the "Tombstone Country." (4) Views of the ridge of Leucite Basalt at Byerock, discovered by Mr. E. David, F.G.S. (5) Micro-photographs of the Leucite Basalt, showing the radial inclusions characteristic of Leucite. (6) Micro-photographs of Basalts from Bathurst and Orange; the Bathurst rock is micro-porphyrific, with crystals of augite, olivine, and felspar; the Orange rock a mass of knitted felspar crystals with granules of augite and some glassy matter. (7) Photographs to show hills of Leucite Basalt at El Capitan, Cobar. (8) Views showing aboriginal carvings around grave-mounds in the Dubbo district. (9) Various stone implements from the western districts, amongst which was a stone hatchet made from rock-crystal, or smoky quartz. (10) Skull of an aboriginal of the Bogan River Tribe.

Mr. David exhibited hand specimens, rock sections, and photographs in illustration of his paper.

Mr. Froggatt showed the saw-flies described by him, with drawings.

Mr. Maiden exhibited the *Xanthorrhoea* resins referred to in his paper ; also a small collection of mosses from the Upper Gloucester district ; and Manna of *Eucalyptus Gunni*, Hook. f., a "White Gum" of the Cooma district. This is believed to be the first time that Manna has been recorded from this species.

Mr. Fletcher exhibited specimens of *Peripatus* from various localities referred to in his paper.

Mr. Etheridge exhibited the fossil described in his paper.

WEDNESDAY, 27TH AUGUST, 1890.

P. N. Trebeck, Esq., J.P., in the Chair.

Mr. J. E. Brown, Director-General of Forests, Sydney, and Mr. B. G. Engelhardt, Jamberoo, were elected members of the Society.

DONATIONS.

"Annales de la Société Géologique de Belgique." Tome XVII., Liv. 2 (1890). *From the Society.*

"Bulletin de la Société Zoologique de France pour l'Année 1888." Tome XIII., No. 9 (Nov.); "1889." Tome XIV., No. 3 (March). *From the Society.*

"Compte-Rendu des Séances du Congrès International de Zoologie, Paris, 1889." *From the General Secretary.*

"Bulletin de la Société d'Etudes Scientifiques d'Angers." n.s. XVI. and XVII. Année (1886 and 1887). *From the Society.*

"Annales de la Société Entomologique de France." 6^e Série, Tome VIII. (1888). *From the Society.*

"Journal de Conchyliologie." 3^e Série, Tomes XXVIII. and XXIX. (1888-89). *From the Director.*

"Abhandlungen herausgegeben vom naturwissenschaftlichen Vereine zu Bremen." XI. Band (1889-90). *From the Society.*

"Bulletin de la Société Impériale des Naturalistes de Moscou." Année 1889, No. 4. *From the Society.*

"Zoologischer Anzeiger." IX. Jahrg., No. 234; XIII. Jahrg., Nos. 326, 338, and 339 (1886-90). *From the Editor.*

"Feuille des Jeunes Naturalistes." No. 237 (July, 1890). *From the Editor.*

"The Victorian Naturalist." Vol. VII., Nos. 2-4 (June-August, 1890); "Tenth Annual Report, &c., of the Field Naturalists' Club of Victoria, 1889-90." *From the Club.*

"Bulletin de la Société Belge de Microscopie." XVI. Année, No. 7 (1890). *From the Society.*

Two Pamphlets entitled "Sur la Faune des eaux profondes de la Méditerranée, au large de Monaco;" "Expériences de Flottage sur les Courants Superficiels de l'Atlantique Nord." Par S. A. S. le Prince Albert de Monaco. *From the Author.*

"Journal of the Royal Microscopical Society, London, 1890." Part 3. *From the Society.*

"Guide to the Contents of the Australian Museum" (1890). *From the Trustees.*

Three Pamphlets entitled "Legends from Torres Straits," No. II.; "Manners and Customs of the Torres Straits Islanders." By Professor A. C. Haddon; "The Natives of Mowat, Daudai, New Guinea." By E. Beardmore. *From Professor Haddon, M.A.*

"Proceedings of the Zoological Society of London for the year 1890." Part I.; "Abstract of Proceedings, 17th June, 1890." *From the Society.*

"Verhandlungen der Gesellschaft für Erdkunde zu Berlin." Band XVII., Nos. 4 and 5 (1890). *From the Society.*

"Jahreshefte des Vereins für vaterlandische Naturkunde in Württemberg." XLVI. Jahrg. (1890). *From the Society.*

Pamphlet entitled "Notes on some Minerals, &c." By J. C. H. Mingaye, F.C.S. *From the Author.*

"Archives Néerlandaises des Sciences exactes et naturelles." Tome XXIV. Livs. 2 and 3 (1890). "De la part de la Société Hollandaise des Sciences à Harlem."

"Seventh Annual Report of the United States Geological Survey, 1885-86." By J. W. Powell, Director. *From the Director.*

"Mémoires de la Société des Naturalistes de la Nouvelle-Russie, Odessa." Tome XV., No. 1 (1890). *From the Society.*

"Bulletin of the United States National Museum, Washington." Nos. 33-37 (1889); "Proceedings." Vols. XII., Nos. 787 and 788; XIII., Nos. 790, 791, 795-798 (1890). *From the Museum.*

"Proceedings of the Boston Society of Natural History." Vol. XXIV., Parts 1 and 2 (1888-89). *From the Society.*

"Proceedings of the American Philosophical Society, Philadelphia." Vol. XXVI., No. 130 (1889). *From the Society.*

"Annals of the New York Academy of Sciences." Vol. IV., No. 12 (1889). *From the Academy.*

"Abhandlungen der königl. böhmischen Gesellschaft der Wissenschaften, Prag.—Mathem.-naturwiss. Classe." VII. Folge, 2 Band (1888); "Sitzungsberichte." Jahrg. 1888 and 1889, I. Band; "Jahresbericht für das Jahr 1888." *From the Society.*

"Mémoires de l'Académie Impériale des Sciences de St. Pétersbourg." vii.^e Série, Tome XXXVII., No. 2 (1889). *From the Academy.*

"Proceedings of the Engineering Association of New South Wales." Vols. I.-III. (1885-88). *From the Association.*

"Catalogue of the Indigenous and Naturalised Plants of Queensland." By F. M. Bailey, F.L.S., Colonial Botanist. *From the Author.*

"Johns Hopkins University Circulars." Vol. VIII., Nos. 69-73, 75; Vol. IX., Nos. 77 and 82 (1889-90). *From the University.*

"The American Naturalist." Vol. XXIV., No. 282 (June, 1890). *From the Editors.*

"Bulletin of the American Geographical Society." Vol. XXII., No. 2 (1890). *From the Society.*

"The Australasian Journal of Pharmacy." Vol. V., No. 56 (August, 1890). *From the Editor.*

"The Journal of Comparative Medicine and Veterinary Archives" Vol. XI., No. 7 (July, 1890). *From the Editor.*

"United States Department of Agriculture: Division of Entomology—Bulletin." No. 22 (1890); "Insect Life." Vol. II., Nos. 11 and 12 (1890) *From the Secretary of Agriculture.*

"Proceedings of the Canadian Institute, Toronto." 3rd Series, Vol. VII., Fasc. No. 2 (1890). *From the Institute.*

"Bulletin of the Museum of Comparative Zoology at Harvard College, Cambridge, U.S.A." Vol. XX., No. 1 (1890). *From the Curator.*

"Bulletin of the American Museum of Natural History, New York." Vol. III., No. 1 (one sheet). *From the Museum.*

Pamphlet entitled "On the Maquoketa Shales, and their correlation with the Cincinnati Group of South Western Ohio." By Joseph F. James, M.Sc. *From the Author.*

"The Transactions of the Entomological Society of London for the year 1890." Part II. *From the Society.*

"Victoria.—Report on the Biological and Microscopical Examination of Samples of Water from the Coliban Supply." By Dr. Oscar Katz. *From the Author.*

"The Perak Government Gazette." Vol. III., Nos. 19-21 (1890). *From the Government Secretary.*

PAPERS READ.

REPTILES FROM NEW GUINEA.

By C. W. DE VIS, M.A., CORR. MEM.

The following reptiles have lately been found on the St. Joseph River, New Guinea, by Mr. A. C. English, collector to his Honor the Administrator.

LACERTILIA.

VARANIDÆ.

Varanus prasinus, Schleg.*Varanus salvadorii*, Ptrs. & Dor.

AGAMIDÆ.

Gonyocephalus dilophus, D. & B.

SCINCIDÆ.

Tiliquina.

Tiliqua gigas, Schneid.

Lygosomina.

Hinulia jobiensis, Mey.*Emoa pallidiceps*, n.s.*Emoa cuneiceps*, n.s.*Heteropus bicarinatus*, Macl.*Heteropus fuscus*, D. & B.*Homolepida englishi*, n.s.

PYGOPODIDÆ.

Lialis burtonii, Gr.

OPHIDIA.

PYTHONIDÆ

Liasis amethystinus, Schneid.*Chondropython azureus*, Mey.*Chondropython pulcher*, Sauv.

EMOA PALLIDICEPS, n.s.

Habit slender ; head subelongate ; snout pyramidal, moderately depressed, subacuminate. A supranasal distinct, or occasionally less

clearly defined. Frontonasal broader than long, forming a broad suture with the rostral, a narrower one with the frontal. Frontal as long as the frontoparietal, but narrower. No interparietal. Parietals forming a long suture behind the frontoparietal, bounded caudad by a pair of nuchals and a pair of temporals. Five supraoculars, the last one minute. Seven supraciliaries. Ear orifice broadly lenticular, with two or three small lobules anteriorly, larger than the palpebral disk. Four labials before the large subocular. 32 to 34 scale rows round the middle of the body; dorsals trilineated but smooth, larger than ventrals; ventrals larger than laterals. Preanals slightly or moderately enlarged. The protracted hind limb reaches the axilla. Digits moderate in length; basal phalanges rounded, distal compressed; subdigital lamellæ smooth, 33 to 36 under the fourth toe. Above olive-brown; nape and upper surface of head paler and generally immaculate; back with blackish spots, generally arranged in a regular double line on each side, and sometimes separated by spaces lighter than the ground colour; sides black, this colour sharply defined above, and especially on the neck, from the ground colour of the upper surface; on the flanks interrupted by a pale streak from the axilla to the groin and frequently spotted with pale brown, occasionally with distinct white spots; beneath yellowish-white, more or less stained with green.

Total length.....150mm. Width of head.....9mm.

Length of head.....13 Length of fore limb...14.5

Length of head and neck...20 Length of hind limb...24.5

Length of flank.....25 Length of fourth toe.....7.5

Length of tail.....100mm.

Many examples. May be compared with *E. singaporensis*, Steind.

EMOA CUNEICEPS, n.s.

Habit elongate, slender; snout elongate, pyramidal, depressed, acuminate. A distinct supranasal. Frontonasal as long as broad, forming a narrow suture with the frontal, a broader one with the rostral. Frontal a little longer than the frontoparietal. Interparietal distinct. Parietals forming a short suture behind the

interparietal, which is bounded caudad by a pair of nuchals and a pair of temporals. Supraoculars four; supraciliaries seven. Ear orifice subcircular or oval, small, as large as or a little larger than the palpebral disk; one to three small lobules on its anterior edge rarely wanting. Five upper labials anterior to large subocular. Scales round the middle of the body in 33 to 36 rows; dorsals rather larger than abdominals, smooth, with or without three or more obscure pigment lines. Preanal scales not or varyingly enlarged. The protracted hind limb reaches the elbow or a little beyond. Digits moderate in length, basal phalanges depressed, distal compressed; subdigital plates 75 to 87 under the fourth toe. Olive-brown, with a strong metallic iridescence, speckled on back and sides with paler scales, or nearly uniform; head above uniform brown; beneath green to greenish-yellow; mental and rostral plates pale buff.

Total length.....	283 mm.	Width of head.....	12.5 mm.
Length of head.....	21.5	Fore limb.....	29
Length of head and neck	34	Hind limb.....	40
Length of flank.....	42	Fourth toe.....	13
Tail.....	201 mm.		

Many examples.

HOMOLEPIDA ENGLISHI, n.s.

Habit of body very stout, tapering rapidly to a small head, and obtusely pointed muzzle. Frontonasal broader than long, forming a short suture with the rostral, and a very short one with the frontal, the prefrontals being nearly in contact. Frontal large, longer than the frontoparietal and interparietal together; frontoparietals barely in contact; interparietal longer than frontoparietals; hinder portion of parietals divided off as nuchal scales forming a suture behind the interparietal. No nuchal plates. Fifth and sixth upper labials beneath the eye; an interrupted series of suboculars. Ear orifice moderate, rounded, shorter than the eye-slit. Scales in 32 rows round the middle of the body, smooth, the central dorsals very wide, short. A pair of enlarged preanals. Tail thick. Fourth toe the longest, subdigital plates 17. Above uniform dark olive brown. Sides with a broad black stripe from

the eye to the groin well defined from the brown of the upper surface and strongly contrasting with the pale buff of the lower surface. Chin and throat lead black; sides of tail with pale blotches in almost regular series.

Total length.....	408mm.	Width of head	20mm.
Length of head.....	26	Fore limb.....	37
Length of head and neck.....	58	Hind limb.....	55
Length of flank.....	72	Fourth toe.....	14.5
Length of body	92	Tail.....	290

One example.

HETEROPUS BICARINATUS, MacL.

A variety without longitudinal streaks, flecked all over the upper surface with black and green specks; tail salmon colour. Preanals enlarged. Ear orifice larger than normal. Subdigital lamellæ 26, scale-rows 30.

HETEROPUS FUSCUS, D. & B.

A well marked colour variety. The back and sides variegated more or less with greenish white spots which form a conspicuous marbling on the sides of the neck; a white band from the ear to beneath the eye constant. In one of the three specimens the interparietal is completely fused with the frontoparietal. The infradigital plates are in two cases 26, in the third 33; the scale rows 36-38. From these characters it seems probable that *H. rhomboidalis*, Pet., is also a variety of *H. fuscus*.

ON QUEENSLAND AND OTHER AUSTRALIAN
LEPIDOPTERA,
WITH DESCRIPTIONS OF NEW SPECIES.

By T. P. LUCAS, M.R.C.S.E., L.S.A., AND L.R.C.P., ED.

ON THE IDENTITY OF *BRONTEUS PARTSCHI*, DE KONINCK (NON BARRANDE), FROM THE UPPER SILURIAN ROCKS OF NEW SOUTH WALES.

BY R. ETHERIDGE, JUNR.—PALÆONTOLOGIST TO THE AUSTRALIAN MUSEUM, AND GEOLOGICAL SURVEY OF N. S. WALES—AND JOHN MITCHELL, OF THE PUBLIC SCHOOL, NARELLAN.

(PLATE XVIII.)

It is our intention to publish a series of papers dealing with the revision of the Silurian Trilobites of New South Wales. Ample material exists in the cabinet of one of us, collected in the Bowning and Yass districts. We shall in addition be able to draw upon the resources of the Mining and Geological Museum, and through the courtesy of Professor W. J. Stephens, M.A., of that of the Macleay Museum at the University. In the latter is now deposited the collection of Mr. Chas. Jenkins, L. S., late of Yass, containing a large number of specimens obtained in the neighbourhood of Yass. We are also permitted to make use of a small number forwarded by Mr. R. L. Jack, the Government Geologist of Queensland, and collected by Mr. J. K. Hume, at Limestone Creek, near Bowning. Lastly some well preserved specimens are to be found in the Australian Museum, which will be referred to in passing.

Whilst glancing generally through the material at our disposal we have been struck by the difficulty of satisfactorily reconciling the Trilobite referred by the late Prof. de Koninck to *Bronteus Partschi*, Barr., with the true species of that name. We consider the Australian species so named to be a distinct form, and propose to separate it under the name of *B. Jenkinsi*, after the gentleman previously mentioned, who has written more than one paper on the geology of the Yass district.

Genus *BRONTEUS*, Goldfuss, 1839.

(*Nova Acta Cæs. Leop. Carol. Nat. Curios.* XIX., pt. 1, p. 360.)

BRONTEUS JENKINSI, sp. nov.

Bronteus Partschi, de Koninck, (non Barr.) Foss. Pal. Nouv. Galles du Sud, 1876, pt. 1, p. 57.

Bronteus sp. Jenkins, P.L.S.N.S.W., 1879, III., pt. 3, p. 217, t. 17, f. 3, 4, 6, 8.

Sp. Char. General form of the body oblong-oval, with straight and parallel sides. *Cephalic Shield* sub-semicircular, about three-fourths the width of the thorax. Glabella battle-axe-shaped, extending to the front margin, and ornamented with concentric anastomosing lines; anterior facial grooves long and somewhat arched. Middle facial grooves marked by faint depressions which do not communicate with the axial furrows, posterior facial grooves wide and short; neck furrow shallow, arched forward medially, and similarly curved forward at its lateral terminations on joining the axial furrows; neck segment moderately wide and gently arched, convexly directed backwards, unarmed; axial furrows much curved, outwards anteriorly, similarly curved posteriorly, but less so; fixed cheeks moderately large, sub-crescentic in shape, with a rather large and pronounced eye lobe; facial sutures anteriorly from the eye to the front angle of the glabella tolerably straight, then curve inwards along the front of the glabella, to about one-sixth of the glabella's front measurement, posteriorly short, sharply curved, and cutting posterior margin about midway between the central line and lateral margins. Free cheeks large, covered with irregular, somewhat vertical wrinkles, crossed by finer lines; limb striated; genal spines stout and broad, extending to and inclusive of third thoracic segment; eyes large, crescentic, with small and numerous facets. *Thorax* wider than long, about one-fourth longer than the head; axis about a sixth wider than the pleuræ and their spines together, slightly arched; axial furrows well marked; pleuræ nearly flat, with short claw-like spines, very narrow grooves bordering the entire posterior margins; semi-facets short and well marked; ornament of transverse wrinkles. *Pygidium* oblong-semicircular, wider than long, four-fifths as long as thorax is wide, anterior margins straight and parallel-sided, posterior

semi-circular, anterior or thoracic margin straight, with a strongly marked axal facet; axis somewhat deltoid, sub-conical, or sub-triangular, less than one-fourth the length of entire pygidium, simulating about seven or eight obscurely subdivided segments; edges emarginate; pleuræ convex at their inner ends, becoming compressed outwardly, gradually widening from behind forwards; central, or axal pleura widest and undivided; inter-pleural grooves well marked, each pleura strongest along its inner margin; transversely concentrically crenated, also with a number of indented lines traversing the medial part of the surface; limb flat, and moderately wide and striated sub-concentrically.

Obs.—In comparing this with other described species, we may at once dismiss all those possessing a bifurcate median pleura in the pygidium, which in *B. Jenkinsi* is entire. We believe this species to be that referred to by de Koninck as *B. Partschi*, Barr., and it certainly is the form figured by Jenkins without specific name, although he distinctly called attention to the resemblance of his fossil to the above species. In the first place *B. Jenkinsi* acquired much larger dimensions, as a rule, than *B. Partschi*, one of the pygidia of our species being equal to the entire length of the body in the Bohemian Trilobite. In the second place, the much stronger and better marked glabella furrows, the more definite segmentation, and dissimilar axis of the tail, and probably the more intricate ornamentation of the test separate the species. It further differs in possessing a much squarer pygidium, arising from the straight sides, and in this character there is also a marked discrepancy from the structure of such species as *Bronteus Edwardsi*, Barr., *B. planus*, Corda, *B. Brongniarti*, and others. On the other hand *Bronteus Jenkinsi* resembles *B. Partschi* in the forward extension of the glabella and the near equality in width of the thoracic axis to the pleuræ.

On examining a number of specimens we find that the thoracic axis is about one-sixth wider than the pleuræ, especially in large examples; but in two medium-sized specimens the relative widths practically agreed. We also find that the proportionate length

and width of the pygidium varies to some extent. The relative length of thorax to pygidium runs about 2:3. Four specimens complete enough to take measurements gave thorax to pygidium 9:14, 10:15, 11:15, and 14:20 in sixteenths of an inch, which in each case approaches the ratio above given. The ratio between the length of cephalic shield and thorax is much more variable. The measurements of three specimens gave 13:17, 15:18 and 20:28, as the ratios in thirty-seconds of an inch, the difference being greatest in the largest specimen measured.

Mr. Jenkins assigns eleven thoracic segments to his species, but we cannot perceive more than the normal number found in this genus, viz., ten. He also describes three in the axis of the pygidium but our best preserved tails possess certainly seven.

Loc. and Horizons.—Bowling Creek, in the Lower Trilobite Bed* of the Bowling series († Wenlock), associated with *Bronteus longespinifex*, Mitchell, *Encrinurus Mitchelli*, Foerste, *Acidaspis Verneuili*, Barr., and *Sphærexochus mirus*, Beyr. The Hume beds (Jenkins), are identical with the Bowling series, but Mr. Jenkins places his Yass beds below the Hume beds or Bowling series. From both of these beds Mr. Jenkins collected our species [Hatton's Corner in the Hume beds.] We are disposed to rank the Yass beds with the lower portion of the Bowling series embracing at least the Lower Trilobite bed, because the fossils of the two localities seem to agree closely.

EXPLANATION OF PLATE

(All figures nat. size, except otherwise indicated.)

- Fig. 1.—Pygidium and portion of thorax of a fairly large specimen, rather narrow tailed.
 Fig. 2.—Cephalic shield of a large specimen, with free cheeks missing.
 Fig. 3.—Pygidium from a well preserved, large and wide specimen.
 Fig. 4.—Free Cheek.
 Fig. 5.—Free Cheek ($\times 3$), showing ornamentation and facets of eye.
 Fig. 6.—Free Cheek (mould) $\times 2$, showing ornamentation more distinctly.
 Fig. 7.—Restored outline, drawn to agree in proportions with our largest pygidium.

* Mitchell, Proc. Australasian Assoc. Adv. Sci. for 1888 [1889], 1. p. 294.

NOTES UPON THE PLUMAGE OF THE ADULT MALES
IN CERTAIN SPECIES OF THE GENUS *MALURUS*.

BY A. J. NORTH, F.L.S.

The late Mr. Gould speaking of the genus *Malurus* in his 'Handbook to the Birds of Australia,' says—"The members of this genus are among the most beautiful of our Australian birds. Their gay attire, however, is only assumed during the pairing-season, and is retained for a very short period, after which the sexes are alike in colouring." Further on speaking of *Malurus cyaneus*, "During the months of winter it associates in small troops of from six to eight in number (probably the brood of a single pair), which continually traverse the district in which they were bred. At this period of the year the adult males throw off their fine livery, and the plumage of the sexes becomes so near alike that a minute examination is requisite to distinguish them."* Relative to the above statements that the males of the genus *Malurus* only assume their full plumage during the pairing season, and that the adult males throw off their fine livery in winter and can hardly be distinguished from the females, Gould is decidedly in error.

During the last three or four years I have paid particular attention to the subject, and find that as regards *Malurus cyaneus* the results of my observations are that after the male has once assumed its fully adult plumage, it always retains that phase, and that the fully adult male is as brilliant in its colouring during the winter months as it is in spring and summer. The winter just past is well known to have been one of the coldest we have experienced for several years, yet on reference to my note-book I find that from the 25th of May until the middle of August I have frequently observed the fully plumaged males of *M. cyaneus* in the public

* Gould, Handbk. Bds. Austr., Vol. I., pp. 317-8.

parks and gardens about Sydney. At Dobroyde I have also noted them during May, June, July and August. On the 2nd of August I met with a pair of *M. cyaneus* in Dobroyde garden; they were very tame and allowed me to approach within a few feet of them; the male was a most brilliantly plumaged bird, and fully excelled, if not exceeded, any I have seen during spring and summer; Mr. James Ramsay who was present at the time informed me that the pair in question were bred in the garden about the end of 1889 and had remained ever since, and that at the end of March when they were about three months old, and before the male had commenced to assume his distinguishing plumage, they constructed a nest in the bushy end of a drooping branch of a pine tree (*Araucaria cunninghami*) growing in the garden; this was unfortunately discovered by a Narrow-billed Bronze Cuckoo (*Lamprococcyx basalis*) which deposited an egg in it, which was hatched by the *Malurus* upon whom devolved the rearing of the intruder and sole occupant of the nest.* I saw the young male *Malurus* referred to on the 21st of June; it had then just attained its fully adult plumage.

The young males of *M. cyaneus* are similar to the females until they are between three and four months old, when they commence to develop their distinguishing plumage, and assume their full adult livery at the end of six months.

About Dobroyde this winter I have met with *M. cyaneus*, in pairs; this is exceptional, as in the Botanic Gardens and elsewhere I have mostly observed them in small companies from five to seven in number, flitting from bush to bush, or tripping about on the grass. Some of these companies exhibit the different stages of plumage assumed by the male of this species, viz., juvenile, semi-adult, and fully adult; others exhibit only the dull coloured plumage of the female, the latter probably the last brood of the season, for these birds breed till late in the autumn. One may, however, see probably four or five birds in the brown plumage of the female, or the mixed brown, blue and black, of the semi-adult,

* This pair again started to build on the 16th of August on the site of their old nest in the pine tree.

to one of the fully adult males in their rich velvety blue and black attire. Gould may have been misled by seeing young males in their semi-adult stage of plumage during winter, though in no instance does he make any reference to this interesting phase of plumage of the young males of *M. cyaneus* in their progress towards maturity.

Hitherto I have confined my remarks to *M. cyaneus*, which any member can verify for himself by watching carefully for these birds in any of the public parks or gardens about Sydney, a favourite resort of this species being the ornamental shrub covered beds and grassy lawns of the lower portion of the Botanic Gardens, and the fully adult male may occasionally be met with during winter in the grounds surrounding this very Hall of the Linnean Society.*

In illustration of my paper I exhibit to night a series of *M. cyaneus*, *M. lamberti*, *M. cruentatus*, *M. elegans*, and *M. leucopterus* in the various stages of plumage referred to, also adult males procured during the depth of winter for comparison with others obtained during spring and summer.

In the Red-backed section of the *Malurus*, young males bred early in the season change the colour of their feathers, from brown to black and red, and retain the full colour of the adult after their first moult. Dr. Ramsay informs me he has also observed the change in the colour of the feathers of the young males in *Ptilorhis paradiseus*, and *Sericulus melinus* in their progress towards maturity.

On the 16th of July, Mr. George Barnard of Duaringa, Queensland writes as follows :—"In reply to your letter respecting the winter livery of the *Malurus*, found in this neighbourhood, as far as our experience goes there are always some males to be seen in full plumage during winter, but generally very scarce, whether

* Mr. Fletcher informs me that, as both Mr. Froggatt and himself have observed, it has been almost a daily occurrence all through the winter months to have one's attention called to the antics of a full-plumaged male perched on a branch close to one of the windows vigorously pecking at his own reflection in the glass.

hiding or not when in full plumage I cannot say, but with *M. melanocephalus* you may disturb eight or more apparently females, and after a little while you may see a full plumaged male dodging through the grass seemingly to escape observation. I have often noticed some of the birds with a little red on their backs; these I always considered to be young males, but may they not have been old males with only partial plumage? but I hardly think so, as I well remember when I lived in Tasmania I used to shoot *M. gouldi* for skins always in winter, and here *M. lamberti* is always in full plumage, so that I think points to the fact the male Warblers always retain their adult plumage."

Mr. George Masters, the Curator of the Macleayan Museum at the University, informs me that when he was in Tasmania he also observed the male of *M. gouldi* in full adult plumage during winter.

Mr. K. H. Bennett of Yandembah, New South Wales, writes as follows:—"In answer to your query *re Maluri*, I certainly think that Gould is in error, or if the change in plumage does occur, it is by no means constant, for males of the several species found in this locality are to be met with in full livery at all times, and so far as my experience goes are as plentiful in winter as at any other season, but I have frequently met with families or companies of more than a dozen individuals in the sombre dress of the female; these could not have been a single brood as there were far too many. The species found here is *M. leucopterus*, but some sixty miles to the north of this place *M. melanotus*, *M. splendens*, and *M. leuconotus* are also to be met with; the two latter, however, are so rare that I cannot speak with certainty as to the retention of the full plumage of the males, but I am certain that full plumaged males of *M. leucopterus* and *M. melanotus* are to be met with at all times of the year."

Mr. James Ramsay, of Dobroyde, paid particular attention to the various phases of plumage assumed by the males in the genus *Malurus*, during several years residence on Tyndarie Station, in the interior of New South Wales, and as regards the species found there, viz., *M. lamberti*, *M. leucopterus*, *M. leuconotus*, and *M.*

callainus, he assures me that the male having once assumed the adult phase of plumage, always retains it the whole year round.

Dr. Ramsay is of opinion that in the section of the genus *Malurus* in which the blue predominates, the males having once attained their full adult plumage always retain it, but does not feel quite so certain about the members of the red-backed section.

From the experience of the authorities quoted above, and my own as regards that of *M. cyaneus*, together with a careful examination of a large series of each known species of the genus, I have not the slightest doubt that the males of all species of the genus *Malurus* will be found to retain their full adult and distinguishing phase of plumage after once they have assumed it.

NOTES AND EXHIBITS.

Mr. Maiden exhibited a gum new to science, viz., that of *Panax dendroides*, F.v.M., var. *angusta* from the Snowy River.

Mr. Palmer exhibited portions of a *Loranthus* parasitic upon a pear-tree, showing in an interesting manner some of the structural peculiarities of the plant. Also, examples of the foliage of a cultivated *Eugenia* infested with Homopterous insects, (probably *Psyllidæ*); and he stated that a native *Eugenia* in the bush about Sydney at the present time is also similarly attacked.

Mr. Froggatt exhibited some larvæ of an undetermined species of saw-fly, received from Mr. French, which are destroying the tanning wattle, *Acacia decurrens*, about Melbourne. They not only destroy the leaves, but also gnaw the bark, soon killing the trees. The pest was locally known as "Fire-blight," until Mr. French, the Government Entomologist of Victoria, discovered and recognised the small grubs.*

Mr. Olliff exhibited an interesting collection of insects from Queensland.

Mr. Fletcher showed specimens of a small worm (family *Tubi-
ficidæ*) which, like the remarkable trematode (*Temnocephala*) described by Dr. Haswell, lives as a commensal upon *Astacopsis serratus*.

Some discussion then took place as to the meaning of the now universally adopted term "kangaroo," namely whether, as has recently been reported, in the dialect of the blacks of the Endeavour River the word signified "I don't know" and was so used in answer to the queries of Captain Cook's party, or whether as Cook supposed it really was the name of the animal in use among the aborigines of the locality.

Mr. North exhibited specimens of *Malurus* in different stages of plumage as referred to in his paper.

* The attempt to breed perfect insects from the larvæ exhibited was unsuccessful. Mr. French, however, succeeded with another batch, and he subsequently sent word to the effect that they turn out to be larvæ of a beetle, and not of a saw-fly as was supposed. The beetle in question is a *Paropsis*, probably *P. orphana*, Cr. (Ed.)

WEDNESDAY, 24TH SEPTEMBER, 1890.

The President, Professor Stephens, M.A., F.G.S., in the Chair.

Mr. G. Orton Owen and Mr. R. Helms were present as visitors.

DONATIONS.

"Siebold's Flora Japonica." By Dr. J. G. Zuccarini : "Challenger Reports.—Zoology." Vol. XXXII.; "Physics & Chemistry." Vol. II. : "Curtis's Botanical Magazine." 3rd Series, Vol. XLV. (1889); "Nouvelles Archives du Muséum d'Histoire Naturelle, Paris." 3^e Série. Vol. I. (1889); "Archives de Biologie." Tome IX.(1889); "Zeitschrift für wissenschaftliche Zoologie." Bd. XLVIII. & XLIX. (1889-90); "Notes from the Leyden Museum." Vol. XI., Nos. 2-4 (1889). *From Sir William Macleay, F.L.S., &c.*

"Norges Væxtrige—et Bidrag til Nord-Europas Natur- og Culturhistorie af Dr. F. C. Schübeler." 3 vols. (1885-89). *From the Royal University of Norway, Christiania.*

"The Agricultural Gazette of New South Wales." Vol. I., Part 2 (1890). *From the Director, Department of Agriculture.*

"Archiv für Naturgeschichte." 56th Jahrg., Band I., Heft 2 (1890). *From the Editor.*

"Tables Générales du Bulletin de la Société Royale de Botanique de Belgique, Tome I.-XXV. (1862-87)." *From the Society.*

"The Perak Government Gazette." Vol. III., Nos. 22 & 23 (July & August, 1890). *From the Government Secretary.*

"Zoologischer Anzeiger." XIII. Jahrg., Nos. 340 & 341 (1890). *From the Editor.*

"Bulletin de la Société Zoologique de France pour l'Année 1890." Tome XV., Nos. 4 & 5 (April and May). *From the Society.*

A Pamphlet entitled—"Australian Fungi." By M. C. Cooke. *From Baron Ferd. von Mueller, K.C.M.G., M. & Ph.D., F.R.S.*

"Victoria.—Reports and Statistics of the Mining Department for the quarter ended 30th June, 1890." *From the Secretary for Mines.*

"Western Australia.—Annual General Report for 1888-89." By H. P. Woodward, F.G.S., F.R.G.S., Government Geologist. *From the Author.*

"Department of Agriculture, Melbourne; Royal Commission on Vegetable Products—Progress Reports I.-VIII (1886-90);" "Report No. I.—Ensilage;" "Journal of the Board of Viticulture for Victoria, Nos. I. III. (Extract), 1888-90." *From the Secretary, Royal Commission on Vegetable Products.*

"Department of Agriculture, Melbourne. — Bulletin." Nos. 1, 6, and 7 (1888-90); "Report of the Council of Agricultural Education for the years 1884-87 and 1888-89;" "Report, &c., of the Australasian Stock Conference held in Melbourne, Nov., 1889;" "Guides to Growers." Nos. 2 and 3. *From the Secretary of Agriculture.*

"Memoirs of the Geological Survey of India." Vol. XXIV., Part 2 (1890). *From the Director.*

"The Victorian Naturalist." Vol. VII., No. 5 (September, 1890). *From the Field Naturalists' Club of Victoria.*

"The Journal of the Bombay Natural History Society." Vol. V., No. 2 (1890). *From the Society.*

"The Chemist and Druggist of Australasia." Vol. V., No. 9 (Sept., 1890). *From the Publisher.*

"Feuille des Jeunes Naturalistes." No. 238 (August, 1890). *From the Editor.*

"Revista de Sciencias Naturaes e Sociaes, órgão dos Trabalhos da Sociedade Carlos Ribeiro, Porto." Vol. I., No. 4 (1890). *From the Society.*

"Verhandlungen des naturhistorischen Vereines der preussischen Rheinlande, &c." Folge 5, Jahrg. VI., Zweite Hälfte; Jahrg. VII., Erste Hälfte (1889-90). *From the Society.*

"The Melbourne University Calendar, 1891." *From the Council.*

"The Quarterly Journal of the Geological Society of London." Vol. XLVI., Part 3 (No. 183), 1890. *From the Society.*

"Proceedings of the Zoological Society of London for the year 1882." Part 1. *From the Society.*

"The Journal of Comparative Medicine and Veterinary Archives." Vol. XI., No. 8 (August, 1890). *From the Editor.*

"The American Naturalist." Vols. XXIII., No. 276 (Dec., 1889); XXIV., No. 283 (July, 1890). *From the Editors.*

"The Canadian Record of Science." Vol. IV., No. 3 (1890).
From the Natural History Society of Montreal.

"Bulletin of the Museum of Comparative Zoology at Harvard College, Cambridge, U.S.A." Vol. XVI., No. 9 (1890). *From the Curator.*

"Proceedings of the United States National Museum, Washington." Vols. XII., No. 789; XIII., Nos. 792 & 793 (1890).
From the Museum.

PAPERS READ.

STRAY NOTES ON LEPIDOPTERA.

By A. SIDNEY OLLIFF,
GOVERNMENT ENTOMOLOGIST, NEW SOUTH WALES.

No. 1.

Under the above title I propose from time to time to offer remarks on new and little-known species that may come under my observation. In this, the first of these notices, I describe a singularly fine species of Hawk-moth which I have failed to find in Boisduval's Monograph or Butler's Catalogue of the group although it has been known to Sydney collectors for many years. In deciding upon its affinities I have had the friendly advice of that experienced lepidopterist Mr. Henry Edwards, with whose name I have ventured to associate it.

SPHINGIDÆ.

MACROSILA EDWARDSI, sp.n.

Head and thorax rich umber-brown, mottled with ochreous-yellow and brown scales, the latter with a narrow transverse band anteriorly and a cream-yellow patch on each side at the base ; the patagia and hind margin edged with dark umber-brown ; palpi long, erect, upstanding, white beneath, umber-brown above and for the apical half below. Antennæ light umber-brown above, paler beneath. Forewing rich umber-brown, with greyish-white markings, a few light brown and ochreous scales mingled with the dark scales ; a bright cream-yellow patch at the base extending more than half way towards the costa, which is mottled near the base with greyish-white scales ; three irregular transverse bands composed of greyish-white scales before middle ; two similar bands near apex extending from costa towards hind-margin, the first narrow and interrupted about the middle of wing, second broad,

upturned, reaching the hind-margin about the middle, the apical area, hinder angle, and outer half of the inner margin mottled with greyish-white; cilia of hind-margin white, barred on the veins with broad patches of pale umber-brown. Hindwing pale salmon-red, the base cream-yellow, suffused with smoky-brown above, two abbreviated oblique narrow brown bars extending from abdominal margin towards middle, a triangular white patch at hinder angle, beyond which is a small rich brown patch edged posteriorly with bluish scales; veins 4-7 ornamented beyond the middle with narrow streaks of white scales, relieved in the middle by black. Cilia of hind-margin from apical angle to hinder angle white, barred on the veins with umber-brown. Abdomen pale umber-brown, mottled with whitish and ochreous scales, the base and patches of scales at the sides cream-yellow. Beneath the wings are light brown, the bases whitish, with a sinuous transverse marking on both fore and hindwing near the apex extending from costa to inner margin; hinder part of thorax and abdomen white. Legs brown; inner side of anterior and intermediate femora white; posterior femora wholly white except a light brown patch externally at base and a similar patch internally behind the spurs. Expanse of wings, 102 mm.; length of body, 40 mm.

Brisbane, Queensland; Lower Hunter River, New South Wales.

This rare species, perhaps the most beautiful of the Australian Hawk-moths, has existed for many years in more than one local collection, but as far as I am aware has never yet received a name. A single specimen obtained at Ash Island, Hunter River, in 1860 or thereabouts, by the late Mr. A. W. Scott is now in the collection of the Australian Museum, and I have seen other specimens from the same district and from Brisbane, the latter in the possession of Mr. F. G. T. Smith.

Macrosila Edwardsi is allied to *M. casuarinæ*, Fabr., the most abundant of our Sphingidæ, but is entirely different in colour and marking, and has the palpi longer, more erect, and outstanding.

REVISION OF THE GENERA *COLPOCHILA*
(INCLUDING *HAPLONYCHA*), *SERICESTHIS* AND
THEIR ALLIES, WITH DESCRIPTIONS
OF NEW SPECIES.

BY THE REV. T. BLACKBURN, B.A., CORR. MEM.

PART I.

Since the completion of my Revision of the genus *Heteronyx* I have been studying some of the other Australian genera which belong to the group of *Melolonthidæ* called by M. Lacordaire "*Heteronycides*." This group seems to fall naturally into three subgroups,—1st containing genera with the elytra abbreviated (*Liparetrus* and its allies), 2nd those with the elytra normal and the claws simple (*Sericesthis*, &c.), 3rd those with the elytra normal and the claws not simple (*Heteronyx* and its allies). The 2nd of these subgroups consists of the following already described genera,—*Sericesthis*, *Telura*, *Haploopsis*, *Haplonycha*, *Colpochila*, *Colobostoma*,* *Pachygastra*, and perhaps *Diphyllocera* and *Homolotropus*. The last named two genera I have not seen, nor are they sufficiently described,—no mention being made *e.g.* of their claw structure beyond that the former is said to have simple *hind* claws (if this implies that the anterior claws are *not* simple the statement disassociates it from the *Sericesthis* subgroup). This second subgroup of *Heteronycides* appears to me divisible again into 2 sections, the former having the hind tibiæ scarcely dilated at the apex (the width at the apex scarcely greater than in the middle)

* I think there is very little doubt that Sir W. Macleay's genus *Platydesmus* is identical with this; Burmeister's suggestion that *Colobostoma* may be identical with *Microthopus*, Hope (near *Liparetrus*), is almost certainly mistaken. Blanchard's description (Cat. Coll. Ent. 1850) seems to have been taken from the original type of *Sericesthis rufipennis*, Boisd., and there seems to be scarcely a doubt that the insect Blanchard described was identical with *Platydesmus*, Macleay. *Microthopus* is a very different insect from Western Australia.

and the breast at most moderately hirsute,—the latter having the hind tibiae strongly dilated at the apex and the breast usually densely lanuginous. The first above named three genera of this group form the 1st section and the other four the second. But in this second section it appears to me that *Haplonycha* must be suppressed as not really distinct from *Colpochila*, and therefore the section will consist of the following genera, as tabulated,—

A. Elytra geminate-striate.

B. Labrum arched above, front tibiae with 3 teeth externally..... *Colpochila*.

BB. Labrum flat above, front tibiae without a trace of more than 2 teeth externally..... *Pachygastera*.

AA. Elytra evenly (or nearly so) punctulate-striate *Colobostoma*.

I am not at this moment prepared to furnish a tabulation of the genera forming the section with hind tibiae scarcely dilated at the apex, because I think at least one new generic name will be required. *Sericesthis* (the only one of them concerned in this part of the present memoir) may be distinguished from the others by its elytra being geminate-striate. I hope to deal with these genera in the next part.

Haplonycha being regarded as not really distinct from *Colpochila*, twenty species are enumerated in Masters' Catalogue. The descriptions of two of these are insufficient for identification (*pinguis*, MacL., and *ciliata*, Boisd.), three I should eliminate from the genus on account of their having genuinely punctulate-striate elytra (*obscuricornis*, Blanch., *striatella*, Blanch., and *rugosa*, Burm.), while *Astrolabei*, Boisd., having its prothorax "covered with long adpressed hairs" is very likely to be a member of some other genus (indeed it might well be *Trichelasmus pilicollis*, Shp.), and *Tasmanica*, Germ., I have already pointed out (Trans. Roy. Soc. S.A., 1887, p. 206) cannot be attributed to this genus.

Since the publication of Masters' Catalogue Sir W. Macleay has described *Colpochila testaceipennis*. It appears moreover so extremely probable (as noted below) that *Melolontha obesa*, Boisd., is not identical with *Haplonycha obesa*, Burm., that I feel obliged to treat them as two species. Thus adjusted the genus contains

15 species which seem to me fairly entitled to their position, and described in such fashion as to be at least possibly capable of identification. Eight of these I have identified with more or less confidence, while there are seven which I am quite confident that I have not seen (*gagatina*, Burm., *iridescens*, Blanch., *scutalis*, Blanch., *crassiventris*, Blanch., *Roei*, Burm., *Gouldi*, Hope, and *obesa*, Boisd.).

On these I will make the following remarks ;—*scutalis*, Blanch., is said to be very close to *obesa*, Boisd., and to differ from it in being of a uniform ferruginous colour, in its closer puncturation, and “especially” by its scutellum being sulcate down the middle. I have not seen any species of the genus presenting the last named character ; if it could have been an individual peculiarity of the example described, then *scutalis*, Blanch., might well be *obesa*, Burm. *C. obesa*, Boisd., is referred to below. *C. gagatina*, Burm., is a smaller species than any of its congeners known to me and is said to be of a deep black colour with the head and prothorax opaque. *C. iridescens*, Blanch., is described as a black species with antennæ entirely testaceous, and the pygidium deeply punctulate ; the only iridescent species known to me which could at all be called “black” is *pulchella*, sp.nov., but it has dark antennæ and the pygidium (not punctulate but) granulate. *C. crassiventris*, Blanch., is a very large (long. 16 lines) species from W. Australia ; I have seen nothing at all like it. *C. Roei*, Burm., is another large species from Western Australia quite different from anything I have seen. *C. Gouldi*, Hope, is from the Northern Territory of S. Australia, and besides other differences is very much larger than any species I have seen from Northern localities.

The external sexual characters so far as I can discover are not strongly marked in the species of this genus. The flabellum of the antennæ seems invariably to consist of shorter (and frequently of less numerous) lamellæ and the intermediate ventral segments to be usually more convex in the female than in the male. The tarsi are invariably longer in the latter sex than in the former. I cannot find any constant distinction in the outline of the apical ventral segment.

The following tabulation will I hope assist in the easy identification of the species treated in the subsequent pages.

A. Antennæ 8-jointed.

B. Prothorax in front and behind thickly clothed

with very long setæ *crinita*, Burm.

BB. Prothorax not as above..... *ruficeps*, Burm.

AA. Antennæ 9-jointed.

B. Iridescent species.

C. Pygidium nitid and more or less punctulate.

D. Puncturation of entire head even and close.

E. Clypeus unusually long, narrowing forward, with almost straight sides *punctiventris*, Blackb.

EE Clypeus normal..... *bella*, Blackb.

DD. Puncturation of head behind much less

close than of clypeus *punctulata*, Blanch.

CC. Pygidium subopaque, minutely granulate or rugulose.

D. Sides of prothorax not sinuate behind middle.

E. Puncturation of prothorax not finer than of elytra..... *solida*, Blackb.

EE. Puncturation of prothorax considerably finer than of elytra *deceptor*, Blackb.

DD. Sides of prothorax strongly sinuate behind middle.....

pulchella, Blackb.

BB. Non-iridescent species.

C. Head, prothorax, scutellum, &c., quite black,

elytra pale testaceous brown..... *bicolor*, Blackb.

CC. Not coloured as *bicolor*.

D. Prothorax having a well-defined lateral gutter with close set punctures which bear long soft hairs.

E. Flabellum of antennæ having more than 4 joints in both sexes.

F. Disc of prothorax with plentiful well-defined puncturation.

- G. Hind tarsi with 2nd joint decidedly longer than basal joint.
- H. Basal joint of flabellum in female scarcely half as long as 3rd joint... *dubia*, Blackb.
- HH. Basal joint of flabellum in female very little shorter than 3rd joint... *laminata*, Blackb.
- GG. Basal joint of hind tarsi equal to 2nd joint *carinata*, Blackb.
- FF. Disc of prothorax without well-defined puncturation..... *fortis*, Blackb.
- EE. Flabellum of antennæ having less than 5 joints in both sexes..... *gigantea*, Burm.
- DD. Prothorax normal.
- E. Pygidium not altogether lævigata and nitid.
- F. Puncturation of head uniform.
- G. Colour of upper surface more or less ferruginous or testaceous.
- H. Basal joint of hind tarsi shorter than 2nd joint.
- I. Species of normal form,—i.e., moderately ovate.
- J. Flabellum 3-jointed in both sexes.
- K. Pygidium nitid.
- L. Elytral suture prominent at apex.
- M. Hind angles of prothorax (viewed from above) well-defined..... *pygmæa*, Blackb.
- MM. Hind angles of prothorax feeble, much rounded off..... *badia*, Burm.
- LL. Elytral suture not prominent at apex..... *pectoralis*, Blanch.
- KK. Pygidium opaque through presence of close and fine, but well defined puncturation.. *destructor*, Tepper.
- JJ. Flabellum 4-jointed in both sexes *sinuaticollis*, Blackb.
- II. Species of very short form much dilated behind..... *obesa*, Burm.

- HH. Basal joint of hind tarsi not shorter than 2nd joint.
- I. Prothorax strongly declivous hindward near base (external teeth of front tibiæ thick and obtuse)..... *gibbosicollis*, Blackb.
- II. Prothorax normal (external teeth of front tibiæ acute)..... *setosa*, Blackb.
- GG. Colour of upper surface entirely shining black..... *funerea*, Blackb.
- FF. Puncturation of clypeus much closer than of hind part of head.
- G. Flabellum of antennæ 3-jointed in both sexes..... *testaceipennis*, MacL.
- GG. Flabellum of antennæ 4-jointed in both sexes..... *gracilis*, Blackb.
- EE. Pygidium quite lævigata and nitid..... *fraterna*, Blackb.

COLPOCHILA FORTIS, sp. nov.

Ovata; sat opaca; testacea, vix iridescens; capite prothorace scutello pedibusque rufescentibus; pectore valde hirsuto, abdomine setoso; capite confertim rugulose confluentem nec crasse, prothorace pygidioque (hoc æquali) sparsissime subtilissime, elytris (his geminato-striatis) fortius minus sparsim, punctulatis; antennis 9-articulatis; tarsorum posticorum articulo 2° 1° manifeste longiori.

Maris antennarum flabello stipitilongitudine æquali, 5-articulato, articulis æqualibus, stipitis articulo ultimo intus breviter acute dentato.

Feminae antennarum flabello stipitis dimidio vix longiori, 5-articulato,—articulo 2° quam 3°, (1° quam ille), paullo breviori,—stipitis articulo ultimo haud dentato.

[Long. 12, lat. 6½ lines.

Closely resembling *H. gigantea*, Burm., but with the prothorax not so transverse (a little less than twice as wide as long), with its front angles more prominent; the elytra are more strongly punctured, the punctures being continuous on the intervals

between the strise of each pair, the flabellum of the antennæ quite different in both sexes, and the uppermost tooth on the front tibiæ larger.

S. Australia.

COLPOCHILA CARINATA, sp.nov.

Ovata; sat opaca; testacea, vix iridescens; capite prothorace scutello pedibusque rufescentibus; pectore valde hirsuto, abdomine setoso; capite confertim rugulose confluer nec crasse, prothorace sparsim leviter, elytris (his geminato-striatis) fortius minus sparsim, pygidio (hoc antice carinato, apice minus late rotundato-truncato) sparsim fortius, punctulatis; antennis 9-articulatis; tarsorum posticorum articulis basalibus 2 sat æqualibus.

Maris antennarum flabello stipitis duabus partibus longitudine æquali, 5-articulato,—articulo 1° quam ceteri paullo breviori,—stipitis articulo ultimo intus breviter minus acute dentato.

Feminae antennarum flabello stipitis dimidio vix longiori, 5-articulato,—articulo 1° quam ceteri paullo breviori,—stipitis articulo ultimo haud dentato. [Long. $12\frac{1}{2}$, lat. 7 lines.

Very like *C. fortis* and *gigantea*, but with the prothorax (which resembles that of *gigantea* in shape, being fully twice as wide as long with front angles only moderately produced) more distinctly punctured and the scutellum wider than in either of them and the flabellum of the antennæ different (that of the female however being almost as in female *fortis*). The carinate pygidium is a very distinctive character. The sculpture of the elytra and the teeth of the front tibiæ are as in *C. fortis*.

Mulwala, N.S. Wales; sent to me by Mr. T. G. Sloane.

COLPOCHILA LAMINATA, sp.nov.

Ovata; sat opaca; testacea vel ferruginea, vix vel haud iridescens; capite prothorace scutello pedibusque rufescentibus; pectore valde hirsuto, abdomine setoso; capite confertim rugulose confluer nec crasse, prothorace elytris (his geminato-striatis) subfortiter minus sparsim, pygidio sparsissime sat subtiliter, punctulatis; antennis 9-articulatis;

elytris apice suturali breviter spinoso-productis; tarsorum posteriorum articulo 2° 1° sat longiori.

Maris antennarum flabello stipite vix breviori, 6-articulato,— articulo 1° quam ceteri paullo breviori,—stipitis articulo ultimo intus breviter acute dentato; pygidio haud carinato, apice late truncato-emarginato.

Feminae antennarum flabello stipitis dimidio sat longiori, 5-articulato,—articulo 1° quam ceteri paullo breviori,—stipitis articulo ultimo intus dentato; pygidio antice carinato, apice late truncato-emarginato. [Long. 15, lat. 8 linea.

Another species closely allied to the preceding two and to *gigantea*, Burm.; average specimens are of larger size however. The prothorax (which is barely twice as wide as long) is more strongly and closely punctured than in any of those three species, while the flabellum of the antennae is different in the male being six-jointed, and the female is equally distinct by the production in a strong tooth-like process of the apical joint of the antennal stipes.

S. Australia.

COLPOCHILA DUBIA, sp. nov.

Ovata; sat opaca; testacea vix iridescens; capite prothorace scutello pedibusque rufescentibus; pectore valde hirsuto, abdomine setoso; capite confertim rugulose confluentem nec crasse, prothorace elytrisque (his geminato-striatis) subfortiter minus sparsim, pygidio sparsissime sat subtiliter, punctulatis; antennis 9-articulatis; elytris apice suturali nullo modo producto; tarsorum posteriorum articulo 2° 1° sat longiori.

Feminae antennarum flabello stipitis dimidio vix longiori, 5-articulato, articulo 2° quam 3^{us} paullo (1^{us} quam ille multo) breviori, stipitis articulo ultimo intus obtuse vix dentato; pygidio antice carinato. [Long. 11, lat. 6 linea.

This species is extremely close to *C. laminata*, the only difference that I can specify of a non-sexual character being that the apex of the suture of the elytra is not produced in a short tooth-like

process, and that the geminate striæ of the elytra are more strongly impressed. The flabellum of the antennæ in the female (with its basal lamella only about half as long as the apical three lamellæ) is however quite distinct from that of *C. laminata*.

I have an example which I believe to be the male of this species; apart from smaller size (which cannot be relied on as a specific character) it scarcely differs from the male of *C. laminata*, except in the two non-sexual characters mentioned above.

S. Australia.

COLPOCHILA BELLA, sp.nov.

Ovata; sat nitida; brunnea vel rufo-testacea; læte iridescens; pectore dense cinereo-hirsuto; abdomine sparsim setoso; capite (hoc sat brevi) confertim rugulose, prothorace pygidioque (hoc apicem versus longitudinaliter vix impresso) subtiliter minus crebre, elytris (his geminato-striatis) sat fortiter sat crebre, punctulatis; antennis 9-articulatis; elytris apice suturali vix spinoso-productis; prothoracis basi bisinuata, quam margo anticus plus hujus dimidio latiori, angulis posticis (superne visis) valde acutis (a latere visis) obtusis.

Maris antennarum flabello stipite vix breviori, 4-articulato, articulo 1^o quam 2^{us} fere duplo breviori; stipitis articulo ultimo intus breviter acute dentato.

Feminæ antennarum flabello stipite minus duplo breviori, 3-articulato, stipitis articulis ultimis 2 intus dentatis.

[Long. $8\frac{1}{2}$, lat. $4\frac{1}{2}$ lines.]

The prothorax is twice as wide as long; from the front angles (which are acute and not very prominent) the sides diverge with but little sinuation to behind the middle, where they are strongly rounded; from this point they converge to the hind angles sinuately (when viewed from above), but without sinuation when examined from the side.

Compared with *C. obesa*, Burm., (to which I compare it merely because that species is a common one, but the two are very different),—besides the very different colour and antennal characters,—the present species has the prothorax more rounded on the sides with very much more defined hind angles (viewed from

above), the elytra more strongly punctured, with their sutural apex briefly spined, &c., &c. The uppermost of the three teeth on the front tibiae in this species is very small as compared with most other *Colpochila*. Two female examples in my collection appear to belong to this species, although differing much in colour. Their elytra are of a rich iridescent blue colour, and their underside is piceous, as also their antennae and legs, but I can find no other difference.

S. Australia ; Adelaide district.

N.B.—A male example taken in the Port Lincoln district (the only iridescent *Colpochila* I have seen from that locality) has the antennae pale testaceous in contrast with the dark brown head (in *C. bella* from the Adelaide district the antennae are always of the colour of the head), the basal joint of the antennal flabellum decidedly less than half as long as the 2nd joint, the scutellum wider and more rounded behind, the elytra a little less strongly punctured, and the general form wider and shorter. I think it is probably best regarded as a local form of *C. bella*, which might perhaps be distinguished as "var. ? *Lindensis*."

COLPOCHILA PUNCTIVENTRIS, sp. nov.

Elongato-ovata ; sat nitida ; rubro-brunnea ; laete iridescens, antennarum flabello laete flavo ; pectore dense testaceo-hirsuto, abdomine sparsim setoso ; capite (hoc antice sat elongato-angustato) confertim rugulose, prothorace pygidioque (hoc postice longitudinaliter sat gibboso), subfortiter minus sparsim, elytris (his geminato-striatis) sat fortiter sat crebre, punctulatis ; antennis 9-articulatis ; elytris apice suturali haud spinoso-productis ; prothoracis basi leviter bisinuata, quam margo anticus minus hujus dimidio latiori, angulis posticis (superne visis) vix acutis ; prothorace longitudinaliter late leviter canaliculato ; abdomine (ad latera crebre in medio sparsim) subfortiter punctulato.

Maris antennarum flabello stipite paullo breviori, 4 articulo, — articulo 1° quam 2° paullo breviori ; stipitis articulo ultimo intus longe acute dentato.

Feminæ antennarum flabello stipite multo breviori, sub-4 articulado,—articulo 1° quam 2° plus duplo breviori; stipitis articulo ultimo intus sat longe sat acute dentato.

[Long. 9-10, lat. $4\frac{2}{3}$ - $5\frac{2}{3}$ lines.

This species considerably resembles *C. bella*, from which it differs (apart from antennal characters) in its long clypeus strongly narrowed anteriorly, the closer puncturation of its elytra and the stronger puncturation of its ventral segments, the sutural apex of the elytra not spinose, and the different form and sculpture of its prothorax, which is much less narrowed anteriorly and has less rounded sides, with hind angles appearing from above much less acute and prominent, &c., &c. This segment is just twice as wide as long, and its sides are almost evenly curved, the greatest width however being behind the middle.

S. Australia; Adelaide district.

COLPOCHILA SOLIDA, sp. nov.

Elongato-ovata; subnitida, nigro-fusca vix iridescens, capite prothorace pedibusque (nonnullis exemplis) obscurioribus, antennis palpisque rufo-testaceis; pectore valde fulvo-hirsuto, abdomine setoso; capite (hoc sat brevi) confertim rugulose, prothorace sat crebre sat rugulose, elytris (his geminatio-striatis) fortius subsparsim punctulatis; pygidio (parte apicali excepta) pustulis minutis (singulis setas brevissimas singulas ferentibus) crebre obsito; antennis 9-articulatis; prothoracis basi bisinuata, quam margo anticus vix hujus dimidio latiori, angulis posticis (superne visis) vix acutis; elytris apice suturali breviter spinoso-productis.

Mas (?) latet.

Feminæ (?) antennarum flabello stipitis dimidio vix longiori, 3-articulato, stipitis articulis ultimis 2 intus breviter obtuse dentatis.

[Long. 11, lat. 6 lines (vix).

The prothorax is scarcely twice as wide as long; from the front angles (which are sharp and moderately produced) the sides (viewed from above) diverge strongly to just behind the middle, where they are strongly rounded; they then converge slightly and scarcely sinuately to the basal angles.

A fine robust species, nearest I think to *C. punctiventris* but with the clypeus much shorter (at the base quite twice as wide as it is long down the middle), the sides of the prothorax very much more strongly rounded, elytra spinose at the sutural apex, pygidium differently sculptured, &c., &c. I am not certain of the sex of the two examples before me; the comparatively short and stout hind tarsi point to their being females.

S. Australia.

COLPOCHILA BICOLOR, sp. nov.

Elongato-ovata; minus nitida; niger, antennis palpis pedibus nonnihil picescentibus, elytris brunneo-testaceis anguste nigro-cingulatis; pectore cinereo-hirsuto, abdomine sparsim setoso; capite (hoc minus brevi) confertim rugulose, prothorace confertim subrugulose, elytris (his geminato striatis) sat sparsim minus fortiter, pygidio (hoc antice subconcentrice rugato) et subtiliter et minus subtiliter, punctulatis; antennis 9-articulatis; prothoracis basi bisinuata, quam margo anticus hujus dimidio latiori, angulis posticis (superne visis) subrectis; elytris apice suturali breviter spinoso-productis.

Maris (?) antennarum flabello stipitis dimidio paullo longiori, 3-articulato, stipitis articulis ultimis 2 intus breviter obtuse dentatis. [Long. 8 (vix), lat. 4½ lines.

The prothorax is just twice as wide as long; from the front angles (which are acute and rather strongly prominent) the sides (as viewed from above) diverge almost without sinuation to well behind the middle, where they are strongly rounded; they then converge, with very slight sinuation to the base.

The almost rugulose puncturation of the prothorax and pale brownish yellow elytra each margined all round very narrowly with black, or dark piceous, renders this a very distinct species. I think the examples I have seen are all of one sex, and I believe them to be males on account of the hind tarsi being comparatively slender and elongate.

S. Australia (?); probably from the interior.

COLPOCHILA DECEPTOR, sp. nov.

Elongato-ovata ; sat nitida ; brunnea vel rufotestacea, iridescens ; pedibus piceis, antennis palpisque pallidis ; pectore dense cinereo-hirsuto ; abdomine sparsim setoso ; capite (hoc sat brevi) confertim rugulose, prothorace minus subtiliter sat crebre, elytris (his geminato-striatis) sat fortiter vix crebre, punctulatis, pygidio obscure sat crebre granulato, granulis singulis setas brevissimas singulas ferentibus ; antennis 9-articulatis ; prothoracis basi leviter bisinuata, quam margo anticus hujus dimidio latiori, angulis posticis (superne visis) distinctis obtusis nullo modo productis ; elytris apice suturali haud productis.

Mas (?) latet.

Feminæ (?) antennarum flabello stipite minus duplo breviori, 3-articulato,—stipitis articulis ultimis 2 intus vix dentatis.

[Long. $9\frac{1}{8}$, lat. 5 lines.

This species is exceedingly close to *C. bella*, from which it differs chiefly by its more closely punctured prothorax, which is a little less transverse (not quite twice as wide as long), with sides not sinuate behind the middle, hind angles not acute and not in the least produced (in *bella* these are subdentiform pointing somewhat outward and hindward), and base less strongly bisinuate ; I notice too that in the example before me the uppermost of the external teeth on the front tibiæ is very much larger than in any example that I have seen of *bella*, and all the teeth are much less acute. The pygidium too is differently sculptured, having the punctures replaced by minute granules each bearing a very short erect seta. I suppose the example before me to be a female, on account of its comparatively short and stout hind tarsi. The antennæ scarcely differ from those of *C. bella* (female).

Central Australia ; McDonnell Ranges ; taken by Mr. A. S. Wild.

N.B.—I have received from Mr. Sloane two examples taken in N.S. Wales which probably pertain to a species distinct from, but very close to, *C. deceptor* ; as they appear to be the same sex (female) I think it better not to give them a separate name for the present, but will content myself with saying that they are of

wider and less elongate form (long. $8\frac{1}{2}$, lat. 5 lines) and have all the teeth of their front tibiae longer and sharper (the uppermost being,—as in the type of *C. deceptor*,—much larger in proportion to the others than it is in *C. bella*, in which it seems invariably to be very small). It is probable that the inspection of males of both species would reveal other distinctions.

COLPOCHILA PULCHELLA, sp. nov.

Breviter ovata (neo fortiter postice dilatata); sat nitida; picea, antennis palpis et coxis anticis (exempli typici) rufescentibus; elytris late cyaneo-iridescentibus; pectore dense cinereo-hirsuto; abdomine sparsim setoso; capite (hoc sat brevi) confertim rugulose, prothorace sparsim minus fortiter, elytris sparsim fortiter, punctulatis; pygidio obscure sat crebre granulato, granulis singulis setas brevissimas singulas ferentibus; antennis 9-articulatis, prothoracis basi bisinuata, quam margo anticus minus hujus dimidio latiori, angulis posticis (superne visis) valde acutis; elytris (exempli typici) apice sat late membranaceis, sutura apice spinoso-producta.

Mas (?) latet.

Feminae antennarum flabello stipitis dimidio multo longiori, 3-articulato, stipitis articulis ultimis 2 intus vix dentatis.

[Long. 7, lat. $3\frac{1}{2}$ lines.

The prothorax is $\frac{3}{4}$ again as wide as long; from the front angles (which are acute and not very prominent) the sides diverge with a moderate sinuation to slightly behind the middle where they are strongly rounded; from this point they converge with a strong sinuation (as viewed from above) to the basal angles which are quite strongly subdentiform,—even more so than in *C. bella*.

This species is not very like any other known to me in shape being short and "stumpy" in appearance but not at all strongly dilated hindward as are the other short species (*C. obesa*, Burm., *e.g.*) known to me. In colour it closely resembles some blue specimens mentioned under the heading of *C. bella*, but differs from them by its much less transverse prothorax (which is less narrowed anteriorly and has its sides more sinuate behind the middle) and its very

differently sculptured pygidium, much larger uppermost tooth of anterior tibiæ, &c. The well defined membranaceous hind border of the elytra (if a constant character) will distinguish this species from almost all other *Colpochilæ* that I have seen.

S. Australia; Gawler; a single specimen.

COLPOCHILA FUNEREA, sp.nov.

Ovata; nitida; nigra, antennis palpisque piceis (illarum flabello testaceo-ferrugineo); pectore valde fulvo-hirsuto; abdomine setoso; capite (hoc sat brevi) minus crebre minus rugulose, prothorace (fere ut capite postice) subcrebre subfortiter, elytris (his geminato-striatis) sat fortiter sat crebre, pygidio sparsim minus fortiter, punctulatis; antennis 9-articulatis; prothoracis basi fortiter bisinuata, quam margo anticus hujus tertia parte latiori, angulis posticis (superne visis) subrotundatis vix distinctis; elytris (exempli typici) apice sat late membranaceis, sutura apice vix acuta.

Maris antennarum flabello stipite vix breviori, 3-articulato, stipitis articulo ultimo intus breviter acute dentato.

[Long. 8, lat. $4\frac{3}{8}$ lines.

The prothorax is about $\frac{2}{3}$ again as wide as long; from the front angles (which are neither very sharp nor much produced) the sides (as viewed from above) diverge without sinuation to decidedly behind the middle where they are strongly rounded and whence they converge again without sinuation and merge into the base without forming a well-defined angle.

S. Australia; Port Lincoln district; a single specimen obtained by sweeping in Eucalyptus scrub.

COLPOCHILA SINUATICOLLIS, sp.nov.

Ovata; sat nitida; ferruginea; capite (et nonnullis exemplis pedibus) infuscato; pectore valde cinereo-hirsuto; abdomine setoso; capite (hoc elongato) confertim rugulose confluentem vix crasse, prothorace elytris (his geminato-striatis) leviter sat crebre, pygidio (hoc antice concentrice subrugato postice longitudinaliter vix carinato) leviter subsquamose, punctulatis;

antennis 9-articulatis; elytris apice suturali breviter spinoso-productis; prothoracis basi fortiter bisinuata, quam margo anticus hujus dimidio latiori, angulis posticis (superne visis) valde acutis, (a latere visis) distinctis.

Maris antennarum flabello stipiti longitudine vix æquali, 4-articulato,—articulo 1^o quam 2^{na} sat breviori; stipitis articulo ultimo intus longe acute dentato.

Feminae antennarum flabello stipite sat breviori, 4-articulato,—articulo 1^o quam 2^{na} plus duplo breviori; stipitis articulo ultimo intus breviter obscure dentato. [Long. 9, lat. 5 lines.

The prothorax is about $\frac{4}{5}$ again as wide as long; from the front angles (which are acute and moderately prominent) the sides diverge with a slight sinuation to a little behind the middle where they are fairly strongly rounded; from this point they converge to the hind angles sinuately (when viewed from above) but without sinuation when examined from the side.

Compared with *C. obesa*, Burm., which it resembles in colour and general appearance,—besides the entirely different antennal characters,—the present species has a considerably larger and much more strongly and rugulosely punctured head,—the clypeus nearly as long as wide,—the prothorax less transverse and with much better defined hind angles, the elytra much less dilated hindward, with their sutural apex spined, &c., &c.

The specimens on which I have founded the above description are from Port Lincoln; I have, however, examples from other parts of S. Australia which I cannot make up my mind to regard as genuinely distinct, although they present somewhat puzzling differences,—some are much smaller (ranging down to 7 lines in length), and some have the prothorax a trifle less narrowed anteriorly. It is quite possible that I have before me a group of very closely allied species,—but I do not at present see my way to treat them as such decidedly.

I may add that this species closely resembles one taken by Mr. Sloane in N. S. Wales and which I believe to be *pectoralis*, Blanch.; that species however (besides antennal differences) has a wider prothorax, apex of elytral suture not at all produced, &c., &c.

S. Australia.

COLPOCHILA PYGMÆA, sp.nov.

Breviter ovata ; sat nitida ; rufo-ferruginea ; pectore valde fulvo-hirsuto, abdomine sparsim setoso ; capite (hoc minus brevi) fortiter vix confertim vix rugulose, prothorace subtiliter minus crebre, elytris (his geminato-striatis) sat fortiter sat crebre, pygidio sparsim obsoletius, punctulatis ; antennis 9-articulatis ; prothoracis basi leviter bisinuata, quam margo anticus vix hujus dimidio latiori, angulis posticis (superne visis) distinctis obtusis ; elytris apice suturali breviter spinoso-productis.

Maris antennarum flabello stipiti longitudine æquali, 3-articulato articulis inter se æqualibus, stipitis articulo ultimo intus breviter acute dentato. [Long. 7, lat. 3½ lines.

The prothorax is about $\frac{3}{4}$ again as wide as long ; from the front angles (which are but feebly produced) the sides diverge with a slight sinuation to a little behind the middle where they are moderately rounded ; thence (as viewed from above) they converge somewhat sinuately to the hind angles, which (viewed from above) appear well defined obtuse angles,—and not far from being right angles.

A well-marked species,—perhaps nearest to *C. obesa*, Burm., which however is a larger insect with the clypeus much shorter (in *C. pygmæa* it is at the base distinctly less than twice as wide as it is long down the middle), the pygidium differently sculptured, &c.

S. Australia.

COLPOCHILA DESTRUCTOR, Tepper.

Ovata ; nitida ; ferruginea, capite elytrorumque sutura (exemplis plerisque) obscurioribus, antennarum flabello læte flavo ; pectore dense cinereo-hirsuto, abdomine sparsim setoso ; capite (hoc sat brevi) confertim rugulose, prothorace sat confertim subrugulose, elytris (his geminato-striatis) minus confertim, pygidio (hoc sat opaco) dupliciter,—et confertissime subtilissime et sparsim magis fortiter, punctulatis ; antennis 9-articulatis (?) ; elytris apice suturali haud spinoso-

productis; prothoracis basi fortiter bisinuata, quam margo anticus fere duplo latiori, angulis posticis (superne visis) distinctis subrectis nullo modo productis, (a latere visis) rotundatis. [Long. 9, lat. 5 lineæ.

The above description is taken from the labelled type of this insect (which is in the South Australian Museum). It was named by Mr. J. G. O. Tepper (Trans. Roy. Soc. S.A., 1878, p. 64). It would not be possible to identify the insect or even to refer it to a genus by the original description, which states that the "flanges of the prothorax are toothed" and that the antennæ are "10-jointed." The latter of these statements is evidently (although the type has no antennæ) a mistake, unless the specimen described was a monstrosity; the former probably refers to the somewhat sharply produced front angles of the prothorax.

As regards the specimen itself, it is excessively close to the insect which I take to be *Haplonycha obesa*, Burm., but which I do not think is *Melolontha obesa*, Boisd., (vide infra), and I should have hesitated to treat it as distinct if it had not previously received a name; but as it is named, and certainly presents some slight distinctions, it seems well to let it stand for the present.

The prothorax of the present species is slightly more than twice as wide as long; from the front angles (which are well produced and acute) the sides (viewed from above) diverge in a feeble arch to the base, but in their hinder half are very nearly parallel, the hind angles appearing almost right angles.

This specimen is decidedly larger than any ordinary type of *C. obesa*, Burm.; its prothorax is more narrowed in front; the front angles of the prothorax are sharper and more produced, the hind angles (viewed from above) appear less rounded off, and the sides are not more divergent in front of the base than at the base itself; the pygidium is a little less nitid, and the general form is more elongate and less dilated hindward.

S. Australia; near Monarto.

COLPOCHILA (HAPLONYCHA) OBESA, Burm.

It appears to me extremely doubtful whether this is identical with *Melolontha obesa*, Boisd., (as Burmeister supposes it to be). The description of *M. obesa*, like most of those in the "Voy. de l'Astr.," is abbreviated to such a degree as to be almost useless, but nevertheless the colour is there stated as "castanea, capite thoraceque nigris" (the other characters mentioned being applicable to almost any species of several genera), and it seems unreasonable to re-describe this insect as being "wholly castaneous" unless with a distinct assertion that the type has been examined and the original description proved erroneous; but, on the contrary, it is clearly to be inferred from his remarks on several other species that Burmeister did not examine Boisduval's types. The species of *Colpochila* are not variable in colour as a rule,—indeed among all the specimens I have examined of the genus I doubt if I have seen any that are as remarkable colour varieties as *M. obesa*, Boisd., would be if it were a var. of *obesa*, Burm. As I have not seen a specimen which I can identify with Boisduval's description, I shall not at present go so far as to propose a new name for *C. (Haplonycha) obesa*, Burm., but I have little doubt it will require a new name eventually. The following remarks will supplement Burmeister's description and assist the identification of his species, which is a well-known N.S. Wales insect, and seems to be (as Burmeister calls it) "common."

It is a shorter species and more dilated behind than any described near ally known to me; in a measured example (female) I find the greatest width across the elytra to be $\frac{3}{5}$ of the length of the whole insect and half again the greatest width across the prothorax. The colour is bright brownish-castaneous, with the hind body and hind legs a little darker than the rest. The head is short,—the clypeus being at its base decidedly more than twice as wide as it is long down the middle. The greatest width of the prothorax is quite twice the length (down the middle) of the same, the base just about half again as wide as the front margin, which is only moderately emarginate and has angles but little prominent;

the sides (viewed from above) appear moderately curved, at their greatest divergence very little in front of the base, and scarcely converging behind that point towards the base; the hind angles (viewed from above) appear almost entirely rounded off, and the base is less strongly bisinuate than in some allied species. The elytra are not wider at their base than the base of the prothorax, and attain their greatest width much behind the middle; their sutural apex has no vestige of a spine. The elytral sculpture is of the kind usual in the genus and is moderately strong. The pygidium has a double system of puncturation,—one very fine and close, the other coarser (but still fine) and less close,—which gives the segment a slightly shagreened appearance. The antennal flabellum is 3-jointed in both sexes (longer in the male than in the female), and is of a somewhat paler colour than the stipes. I have seen no authentic specimen from any locality outside N.S. Wales.

COLPOCHILA FRATERNA, sp. nov.

Ovata; nitida; ferruginea, capite obscuriori, antennis palpisque testaceis; pectore valde cinereo-hirsuto, abdomine setoso; capite (hoc elongato) confertim rugulose, prothorace subtiliter vix crebre, elytris (his geminato-striatis) subfortiter sat crebre, pygidio nullo modo, punctulatis; antennis 9-articulatis; elytris apice suturali breviter spinoso-productis; prothoracis basi fortiter bisinuata, quam margo anticus vix hujus dimidio latiori, angulis posticis (superne visis) sat acutis (a latere visis) distinctis.

Feminae antennarum flabello quam stipitis dimidium sat longiori, 4-articulato,—articulo 1^o quam 2^a dimidium vix longiori; stipitis articulo ultimo intus breviter obtuse dentato.

[Long. 9, lat. 4½ lines.

The outline of the prothorax is almost exactly as in *C. sinuaticollis*, the sides however being scarcely so decidedly sinuate near the base and the hind angles (viewed from above) not quite so acute; indeed the general resemblance of this insect to *C. sinuaticollis* is very great; the following distinctions however seem to

mark something more than a mere variety, viz.,—the puncturation of the prothorax finer and less close and the pygidium altogether lævigata.

I have not seen a male that I can attribute to this species.

S. Australia.

COLPOCHILA GRACILIS, sp.nov.

Elongato-ovata ; sat nitida ; rufo-ferruginea, elytris testaceis ; pectore valde cinereo-hirsuto, abdomine setoso ; capite (hoc sat brevi) sat sparsim haud rugulose (clypeo magis crebre), prothorace subtiliter sparsim, elytris (his geminato-striatis) sparsim paullo magis fortiter, pygidio sparsim minus fortiter, punctulatis ; antennis 9-articulatis ; prothoracis basi sat fortiter bisinuata, quam margo anticus vix plus hujus dimidio latiori, angulis posticis (superne visis) vix acutis nullo modo productis ; elytris apice suturali haud productis.

Maris antennarum flabello stipite longiori, 4-articulato,—articulo 1° quam ceteri vix breviori,—stipitis articulo ultimo intus plus minus elongato-producto.

Feminæ antennarum flabello quam stipitis dimidium longiori, 4-articulato,—articulo 1° quam 2ⁱ dimidium longiori ; stipitis articulo ultimo intus breviter dentato. [Long. 8, lat. 4 $\frac{1}{2}$ lines.

The last joint of the stipes of the antennæ of the male is a little more elongated internally in some examples than in others, so that in some it might almost be counted as a short first joint of the flabellum, which it would make 5-jointed. The prothorax is a little less than twice as wide as long ; from the front angles (which are acute and strongly prominent) the sides diverge to about the middle where they are strongly rounded ; from this point they converge gently and sinuately (viewed from above) to the hind angles.

This species is extremely like *C. testaceipennis*, Macl., but with very different antennæ, longer clypeus (less than twice as wide as long), prothorax sinuately narrowed behind the middle, &c.

S. Australia ; Yorke's Peninsula ; taken by Mr. McDougall.

COLPOCHILA SETOSA, sp. nov.

Elongato-ovata; minus nitida; rufescens, antennis elytrisque pallidioribus; pectore valde hirsuto, elytris setis sat longis suberectis sparsim vestitis, abdomine sparsim setoso; capite (hoc sat brevi) crebre rugulose subtilius (clypeo paullo crassius, et parte pone oculos lævigato, exceptis), prothorace subfortiter sat crebre, elytris (his geminato-striatis) sat fortiter sat crebre subrugulose, pygidio (hoc exempli typici deformi?) crasse obscure rugulose, punctulatis; antennis 9-articulatis; prothoracis basi bisinuata, quam margo anticus hujus tertia parte latiori, angulis posticis (superne visis) subrotundatis; elytris apice suturali vix obscure prominentibus.

Maria antennarum flabello stipite sat breviori, 4-articulato,—articulo 1^o quam ceteri vix breviori,—stipitis articulo ultimo intus acute breviter dentato. [Long. 9, lat. 4½ lines.

Fem. latet.

The prothorax is very nearly twice as wide as long; from the front angles (which are acute but only moderately prominent) the sides (viewed from above) diverge to about the middle where they are feebly arched and then scarcely converge hindward to the hind angles; they are not at all sinuate.

This species is allied to *C. testaceipennis*, MacL., *gracilis*, Blackb., &c.,—but is extremely distinct.

Central Australia, McDonnell Ranges.

N.B.—My collection contains an example labelled "Mts. of Victoria" which I cannot distinguish from the type of *C. setosa*, although I think the discovery of the sexes of both forms might probably show them to be distinct.

COLPOCHILA GIBBOSICOLLIS, sp. nov.

C. setosæ valde affinis; differt prothorace multo convexiori (subgibboso) et tibiæ antice dentibus externis crassis obtusis, tertio (ab apice enumerato) cum ceteris comparato majori. [Long. 7-8, lat. 4-4½ lines.

This species is so close to *C. setosa* that it would be wasting space to repeat at length all the characters the two possess in common. I am unable to specify any differences other than those mentioned above, but they certainly point to something more than mere local variation. The difference in the convexity of the prothorax is very conspicuously noticeable if the longitudinal outline of that segment be inspected from the side. I have seen several specimens of this insect among which I believe both sexes are included,—but if so their sexual characters are very slight. Those specimens which I take to be females are the smaller examples, and have the flabellum of the antennæ and the tarsi a little shorter than specimens that I regard as males,—but the differences are not so well marked as to assure me that they are sexual. The bluntness of the teeth on the front tibiæ together with the uppermost tooth being much larger (in proportion to the lower two teeth) than in *C. setosa*,—in which these teeth are almost as in *C. bella*,—seems a reliable character. The front tibiæ of *C. gibbosicollis* scarcely differ from those of *C. obesa*, Burm. *C. gibbosicollis* may be at once distinguished from *C. testaceipennis*, MacL., (which also occurs in tropical Australia) by its much more closely punctured head, 4-jointed flabellum of antennæ, &c., &c. The pygidium in this species is finely and somewhat closely punctured and also bears a system of sparse setiferous granules.

N. Territory of S. Australia.

SERICESTHIS.

Perhaps there is no other genus of Australian Coleoptera in such a hopeless tangle as this is in. As far as I can ascertain sixteen specific names have been attributed correctly to it or to synonyms of it. The author of the genus is Dr. Boisduval who in 1832 (Voy. de l'Astrolabe) described five species which he called *Serices-this geminata*, *nigrolineata*, *pullata*, *rufipennis* and *cervina*, but without stating the generic characters in a formal manner. These descriptions are extremely poor and it is doubtful whether they would suffice for the positive identification of any of the insects on which they were founded. However in 1850 M. Blanchard

examined the types and in his "Catalogue de la Collection Entomologique (Muséum d'Histoire Naturelle de Paris)" placed three of them under the name *Sericesthis*, along with four new species then described (*aureorufa*, *rugosiceps*, *pruinosa* and *glabra*) and two species (*aericans* and *languida*) which had been in the interval described by Dr. Erichson (Archiv für Naturgeschichte, 1842) as forming a new genus which he (Dr. Erichson) called *Scitula*. In 1842 Hope (Ann. Nat. Hist. IX) had increased the difficulties of *Sericesthis* by attributing to it a species (*Gouldi*) which he supposed to be generically identical with Boisduval's species of *Sericesthis* but which was in reality very different being congeneric with species for which in the next year Dr. Erichson proposed the name *Colpochila*. In 1855 Dr. Burmeister published his admirable work on the *Lamellicornia* (Vol. IV) and in it he recognised the generic identity of three of Boisduval's species of *Sericesthis* with the species which Erichson had subsequently called *Scitula*, and referred the other two (one of them doubtfully, and certainly wrongly) to genera which had been formed subsequently to *Sericesthis*; but nevertheless he suppressed the name *Sericesthis* in favour of *Scitula*, apparently on the ground that there was no formal description of *Sericesthis* as a genus (he does not seem to have been aware how Hope had complicated the question as he does not mention *S. Gouldi*, Hope) and further for the remarkable reason that two of Boisduval's species of *Sericesthis* were congeneric with species for which new generic names had been subsequently provided. In 1856 M. Lacordaire came upon the scene with the *Lamellicorn* volume of that incomparable work the "Genera des Coléoptères" and without any distinct statement of his reasons for doing so reproduced Dr. Burmeister's conclusions.

Here the matter stands at present, the name *Scitula* being thus triumphant and *Sericesthis* having been suppressed. But I venture to think nevertheless that it is not as it should be, and that *Sericesthis* must be restored. The state of the case, admitted by both Dr. Burmeister and M. Lacordaire, is that *Melolontha pruinosa*, Dalm., was the earliest named species of the genus, and

it from *Melolontha*, when Boisduval re-described it as *Sericesthis geminata*. Surely then the name *Sericesthis* must stand.

According to M. Blanchard (whose statement, apparently on the authority of its author, is reproduced by Dr. Burmeister and M. Lacordaire), a species which Boisduval described under a new generic name,—*Cotidia australis*,—is in reality identical with *Sericesthis geminata*, Boisd.,—but in spite of M. Blanchard's having apparently seen the original type I do not think this synonymy can be accepted,—for although Boisduval's description of *Cotidia australis* is insufficient for the *identification* of that insect, the description is absolutely inconsistent with such synonymy; Boisduval's description contains the phrase "subtus pilis fulvis hirsuta," and since nothing is said in any of the descriptions of *Sericesthis* about the underside being hirsute (although in several of them the underside is referred to), it seems fairly certain that Boisduval's *Cotidia australis* is really hirsute on the undersurface (as in *Colpochila*) and not merely furnished with some thin inconspicuously dispersed pilosity (as in *Scitala pruinosa*, Dalm. &c.), and it would be easier to believe that the original type had been confused with some other specimen than that the genus *Cotidia* was founded upon a species not distinguishable by the greater pilosity of its undersurface from the ordinary types of *Sericesthis*. Of course Boisduval's phrase if applied to a *Sericesthis* (say *S. pruinosa*) would not be more than an *exaggeration* of the real condition of the undersurface; but the point is that Boisduval's descriptions of *Cotidia* and *Sericesthis* are irreconcilable with any other theory than that the hirsuteness of the undersurface was the *distinctive character* of *Cotidia*. One other character capable of having been thought generic is attributed to *Cotidia australis*, viz., "thorace globuloso convexo"; but as in no description is the prothorax of *Sericesthis* alluded to at all by Boisduval this is not likely to be the character on which that author founded *Cotidia*; and finally,—if it *were* the character that induced Boisduval to distinguish *australis* generically from his *Sericesthis geminata*, &c., it would be equally effective with the previously mentioned character in proving that *Cotidia australis*

could not be *Melolontha pruinosa*, Dalm., (as more fully described by Dr. Burmeister). My conclusion therefore is that if the specimen credited with being the type of *Cotidia australis* is congeneric with *Sericesthis geminata*, Boisd., that specimen cannot have been correctly identified as the type, and that the only possible course is to erase *Cotidia australis* altogether from the Catalogue as absolutely incapable of identification.

The sexual distinctions of *Sericesthis* are very uncertain and I do not know even *one* that can be called genuinely characteristic of the genus, —indeed to determine the sex of a given specimen (without dissection) it is frequently necessary to fall back on the slight clue afforded by the convexity or otherwise of the outline of the ventral segments viewed from the side. M. Lacordaire states that the males have the joints of the antennal flabellum elongated and the apical ventral segment emarginate behind, but I do not find these characters reliable. In *S. pruinosa*, Dalm., the apical ventral segment of both sexes is emarginate and (beyond the convexity or otherwise of the hind body) I can find no sexual difference except in the antennal flabellum, even the length and robustness of the tarsi scarcely showing any sexual differences. In *S. dispar*, Blackb., both M. Lacordaire's distinctions hold good and in addition the male is black and the female red. In *planiceps*, Blackb., the male has the joints of the antennal flabellum quite short (shorter than in the female of *S. pruinosa*, Dalm.) and the apical ventral segment emarginate behind, while the female (if I am right in its identification) scarcely differs except in being of a lighter colour, in having the apical ventral segment different, and in being less narrowed and more ovate. I cannot doubt the specimens of *S. planiceps* which I regard as males being really of that sex in spite of the shortness of the joints of their antennal flabellum,—their narrow elongate form, hind body not convex longitudinally, very strongly tumid pygidium, strongly emarginate apical ventral segment and extremely long tarsi being in combination I think quite conclusive.

The species of *Sericesthis* present no less difficulty than the generic name, —so much difficulty a fact that it will be necessary,

if I am to make my work intelligible, to discuss the history and synonymy of some of them as an introduction. The type of the genus,—*Melolontha pruinosa*, Dalm., (= *Sericesthis geminata*, Boisd.); is a well known insect, common in N. S. Wales. Of the other four species described by Boisduval *S. rufipennis* has been made the type of a new genus (*Colobostoma*, Blanch.), which I believe should be recognised, and hope to deal with in the next part of this series of "Revisions"; *S. cervina* is not sufficiently described for identification, but is placed by M. Blanchard (presumably from inspection of the type) in *Heteronyx*, while Dr. Burmeister places it in the genus *Caulobius* (the validity of *Caulobius* need not now be discussed, but I may just say that if Dr. Burmeister was right in his identification of it, it has nothing to do with *Sericesthis* or *Heteronyx*, and if he was wrong it is probably a mere synonym of *Heteronyx*; to which subject I hope to return in a subsequent memoir; for the present it is sufficient to say that *S. cervina*, Boisd., is clearly not a true congener of *Melolontha pruinosa*, Dalm., as we now understand the term congener in this case); *S. nigrolineata* is stated by M. Blanchard to be from Tasmania (Boisduval merely says "New Holland") and to be identical with *S. languida*, Er., which determination, though by no means unlikely, must be taken, I think, as "not proven," since M. Blanchard does not appear to have seen the type of *S. languida*, but the description of *S. nigrolineata* (which reads much as if founded on a slight var. of *S. pruinosa*, Dalm.) would, I think, serve to identify the insect if one had an example known to be from Tasmania; *S. pullata* is placed by M. Blanchard as congeneric with *S. geminata* and *nigrolineata*, and therefore is, I presume, a genuine *Sericesthis*, but without the authority of one who had inspected the type I should have thought that the phrase "elytris subtomentosis" in Boisduval's description could hardly apply to a member of this genus. *Melolontha chlorotica*, Gyll., is stated by Dr. Burmeister, after inspection of the original type, to be congeneric with *M. pruinosa*, Dalm.; it seems to be well distinguished by having a transverse carina on the head. The two species from Tasmania, described by Erichson (*sericans* and

languida) ought to be easily recognisable as the descriptions are fairly good; the latter is said to be identical with *S. nigrolineata* (as noted above); both are described as having 8-jointed antennæ and are very likely to be confined to Tasmania. M. Blanchard's four species present a difficulty, inasmuch as their author does not directly refer to the number of joints in their antennæ; by referring to Erichson's description of *Scitula* for the generic characters of *Sericesthis* he no doubt implies that the antennæ are 8-jointed, but on the other hand (judging by my own experience of the proportion of species with 9-jointed antennæ) I should think it very improbable that all the examples before him had those organs only 8-jointed, and further, I am fairly confident that I know his *S. aureo-rufa* and, if so, it certainly has 9-jointed antennæ; therefore I am of opinion that M. Blanchard did not carefully examine the antennæ of the species he described. *S. pruinosa*, Blanch., is not identical with *Melolontha pruinosa*, Dalman., (which species was evidently not known to M. Blanchard); this has been since pointed out by M. von Harold, and Blanchard's species re-named *rugosula*; examples in my collection seem to appertain to it. *S. rugosiceps*, Blanch., from Eastern Australia, is said to have its head (in singular contrast to the name) "subtilissime punctatum," and to be "omnino rufa" with the elytra "dilutius rufa submicantia"; I have seen no species presenting these characters. *S. glabra* appears to be a non-iridescent species from Eastern Australia, with strong puncturation and the sterna "vix pilosa"; perhaps my *S. dispar*, *erosa* and *puncticollis* (vide infra) are all allied to it but they all have much the same thin pilosity on the sterna that is usual in the genus, and the "antennis rufis" of *S. glabra* would not agree with any of them; the description of *S. glabra* is, however, most meagre and would come near fitting almost any non-iridescent species in the genus. As I have seen no non-iridescent *Sericesthis* from Eastern Australia I have no doubt *S. glabra* is a good species unknown to me. Dr. Burmeister added two species to the genus, which he named *rorida* and *ænescens*; I think I know them both and purpose referring to them again in the next part of this "Revision" among

the species with 9-jointed antennæ. Since the issue of Dr. Burmeister's "Handbuch" three species have been named by Sir William Macleay; of these *S. armaticeps*, from Queensland, does not appear to differ in any appreciable character from *S. chlorotica*, Gyll.; *S. suturalis*, also from Queensland, is not very satisfactorily described as the structure of the antennæ is not referred to, but the black suture of its elytra seems to be a distinctive character; *S. pallidula*, from N. W. Australia, is only doubtfully referred to *Scitala*, and unfortunately its author does not specify the reason of his doubts, nor furnish any description of the antennæ; I am fairly certain that I have not seen any of Sir William's species.

The following are descriptions of new species in my collection appertaining to the section of the genus in which the antennal flabellum has only 8 joints. In the next part of this "Revision" I hope to deal with the other section and to supply a tabulation of the species.

SERICESTHIS PARALLELA, sp. nov.

♂. Elongata; sat convexa; sat parallela; sat nitida; rufo-testacea, subtus dilutior, nec pruinosa nec iridescens nec velutina; capite (hoc postice sat tumido) crebrius subtilius sat æqualiter, prothorace (hoc antice parum angustato) paullo fortius minus crebre, elytris (his 4-geminato-striatis, striarum geminatarum interstitiis subplanis) leviter nec crebre, pygidio crebrius fortius, punctulatis; clypeo antice sat fortiter reflexo, truncato vel late vix emarginato; corpore subtus sparsim subtilissime (metasterno ad latera et coxis posticis magis fortiter exceptis) punctulato; sternis femoribusque pilis elongatis sparsissime vestitis; tibiis anticis extus obtuse sat fortiter tridentatis, dente femori proximo quam 2^{us} sat minore; tarsis validis elongatis, subtus sparsissime lineatim setis brevibus vestitis; tarsorum posticorum articulo 1° 2° vix breviori; antennis 8-articulatis, flabello stipite sat longiori; abdominis segmento ultimo late vix emarginato, apice sub-reflexo.

[Long. 4½, lat. 2½ lines.

♀. Latet.

The prothorax has no indication of a dorsal channel, and is quite three-quarters again as wide as long; its base (which is very feebly convex hindward all across) is distinctly less than half again as wide as the front which is not bisinuate (as it is in most species of *Sericesthis*), and is only moderately emarginate with angles not much produced though sharp; the sides are feebly rounded, the hind angles much rounded off. The pygidium is not at all strongly tumid. The tarsi resemble those of *S. planiceps* but are more slender and scarcely so long.

S. Australia; Woodville near Adelaide; two male examples flew to light.

SERICESTHIS MICANS, sp. nov.

Minus elongata; minus convexa; sat nitida; rufa, capite prothorace elytrisque rufo-cæruleis iridescentibus; capite (hoc postice sat tumido) subtilius crebre (postice quam in clypeo minus crebre), prothorace (hoc postice quam antice plus dimidio latiori) crebre fortiter, elytris (his 4-geminato-striatis) sat fortiter minus crebre, pygidio sat fortiter sat crebre, punctulatis; clypeo antice rotundato fortiter reflexo; subtus latera versus metasterno et coxis posticis sparsim sat fortiter, abdomine minus fortiter vix crebrius, punctulatis; sternis femoribusque pilis elongatis sparsissime vestitis; tibiis anticis extus acute tridentatis, dente femori proximo 2° multo minori; tarsis minus robustis minus elongatis subtus vix setosis; tarsorum posteriorum articulo 1° 2° sat æquali; antennis 8-articulatis; flabello (? feminæ) stipite multo breviori; segmento ventrali apicali postice truncato. [Long. $4\frac{1}{2}$ - $5\frac{1}{2}$, lat. $2\frac{1}{2}$ - $3\frac{1}{2}$ lines.

Var. (?) supra vix cærulea.

The distinguishing characters of this species among those known to me having their upper surface iridescent are the distinctly *bluish* tone of the upper surface, in some examples entitling the insect to be called a bright blue one,—and the close strong puncturation of the prothorax accompanied by an exceptionally sparse puncturation of the sides of the metasternum and hind coxæ. The prothorax is nearly twice as wide as long, its front angles well

produced and sharp (more so than in *S. planiceps*,—much as in *S. pruinosa*, Dalm.), its sides only moderately rounded, its hind angles scarcely defined (less distinct than in *S. pruinosa*, Dalm.,—much as in *S. planiceps*); it is less convex longitudinally (*i.e.*, less declivous behind) than in *S. planiceps*; it has no trace of a dorsal channel; its puncturation resembles that of *S. planiceps* and is very evidently stronger and closer than in *S. pruinosa*, Dalm. The puncturation of the metasternum and hind coxæ is evidently less close than in *S. pruinosa* and very much less close than in *S. planiceps*,—the hind coxæ being (as in *planiceps*) decidedly shorter in comparison with the metasternum than in *S. pruinosa*. From *S. parallela* the closely punctured prothorax with its bisinuate front margin is in itself a very sufficient distinction.

I am of opinion that all the half dozen specimens I have seen of this species are females, although the capriciousness of this genus in respect of sexual characters (already alluded to) suggests the question whether it is possible that the light coloured examples, with the blue colouring a mere iridescence, can be males; in these the ventral segments certainly seem a little flatter than in the genuinely blue examples.

S. Australia; near Port Victor.

SERICESTHIS PLANICEPS, sp.nov.

♂. Elongata; subcylindrica; postice haud dilatata; sat nitida; testaceo-rufa, prothorace elytrisq̃e brunneo-purpureis, nec pruinosa nec iridescens nec velutina; capite plano æquali sat crebre sat æqualiter punctulato; prothorace crebrius subtilius, elytris (his 4-geminato-striatis, striarum geminatarum interstitiis sat fortiter convexis) fortiter minus crebre, pygidio crebre fortius, punctulatis; clypeo antice late leviter rotundato minus fortiter reflexo; corpore subtus ad latera sat fortiter, medium versus gradatim subtilius, punctulato; sternis femoribusq̃e pilis sparsis vestitis; coxis posticis quam metasterno multo brevioribus; tarsis validis elongatis, subtus sparsissime lineatim setis validis brevibus vestitis; tarsorum posticorum articulis primis 2 inter se subæqualibus; antennis 8-articulatis,

flabello stipite sat breviori; abdomine segmento ultimo haud punctulato, transversim rugato, apice late vix emarginato subreflexo. [Long. $5\frac{1}{2}$, lat. $2\frac{1}{2}$ lines (vix).

♀. (?) Minus elongata; paullo minus convexa; prothorace elytrisqve vix purpurascens; clypeo antice vix rotundato, paullo magis fortiter reflexo; antennarum flabello vix breviori; abdominis segmento ultimo punctulato, postice haud emarginato. [Long. $5\frac{1}{2}$, lat. $2\frac{1}{2}$ lines.

The prothorax has no indication whatever of a dorsal channel; it is slightly more than half again as wide as it is long; its base (which is gently and almost evenly convex hindward) is about half again as wide as the front which is strongly and somewhat bisinuate concave in outline, with sharp angles; the sides are fairly strongly rounded and are at their greatest divergence scarcely behind the middle; the hind angles are much rounded off but not quite non-existent. The pygidium is strongly tumid in the male, —even more so than in *S. pruinosa*, Dalm.; in the female it is much less so. Two or three short stout bristles are found placed along the middle line on the underside of each tarsal joint. The salient characters of this species seem to be the flat head (the hinder part being not in the least tumid and scarcely differing in puncturation from the clypeus from which it is separated by an angulated suture) the colour of which is red in strong contrast (in the male) with the purplish-brown prothorax and elytra,—together with the very long stout tarsi (the hinder 4 about twice as long as their tibiae) and the entire absence of pruinosity, iridescence, and any "velvety" appearance. The sides of the metasternum are very closely punctured, the interstices of the punctures appearing from a certain point of view as continuous transverse zig-zag wrinkles.

The species of *Sericesthis* with 8-jointed antennae described by Burmeister are all pruinose. Of those described by Blanchard (the number of joints in the antennae is not stated in any of his descriptions though it seems to be implied that they are 8) *S. glabra* is not said to be pruinose; its description would fit almost any species of the genus except in respect of the words "fere glabra."

which certainly would not apply to any specimen I have seen of the above. *S. armaticeps*, MacL., and *chlorotica*, Gyll., have a strong transverse ridge on the clypeus; *nigrolineata*, Boisd., is not intelligibly described but seems to have a pattern-like marking on the elytra; *sericans*, Er., has the hinder part of the head blackish and the puncturation "obsolete"; *languida*, Er., is a coarsely rugulose species.

S. Australia; widely distributed.

SERICESTHIS PARVIPES, sp. nov.

♂♀. A præcedente vix differt nisi tarsis gracilibus brevibus subtus setis gracilibus sat elongatis vestitis.

[Long. $5\frac{1}{8}$, lat. $2\frac{4}{5}$ lines.

I believe the two examples (in my collection) of this species to be male and female although I can discover no difference between them except in the pygidium of one (probably the male) being strongly tumid and the apical ventral segment being feebly wrinkled transversely, with puncturation obsolete (this segment is almost straight behind in both examples), while in the other the pygidium is scarcely tumid and the apical ventral segment is not wrinkled and is much more distinctly punctured. The colour of both examples is brownish-ferruginous and the shape is much like that of *S. planiceps* (female). The clypeus in both examples is even more strongly reflexed in front than in *S. planiceps* (female) and in the male is emarginate in the middle of the front. Otherwise it does not differ much from *S. planiceps* except in the tarsi being much shorter and more slender (considerably more so than in *S. pruinosa*, Dalm.) with their underside more setose.

S. Australia.

SERICESTHIS DISPAR, sp. nov.

♂. Sat elongata; postice vix dilatata; sat nitida; nigra vel piceo-nigra, nec pruinosa nec iridescens nec velutina, antennis palpis tarsisque plus minus dilutioribus; capite confertim fortius, prothorace pygidioque (hoc longitudinaliter sulcato) magis fortiter minus crebre, elytris

fortiter rugulose (his evidentior 4-costatis, interstitiis transversim rugulosis) punctulatis; clypeo antice aequaliter rotundato sat fortiter reflexo; capite postice sat tumido, corpore subtus sat fortiter minus crebre punctulato, sternis femoribusque pilis sparsis subfulvis vestitis; tibiis anticis extus sat fortiter tridentatis, dente femori proximo quam 3^{us} dimidio minore; tarsorum posticorum articulo 1^o 2^o vix breviori; tarsis subtus haud lineatim setigeris; antennis 8-articulatis, flabello stipite paullo longiori; abdominis segmento ultimo late vix emarginato, apice subreflexo.

[Long. $4\frac{3}{8}$, lat. $2\frac{2}{5}$ lines (vix).

♀. Latior; postice magis dilatata; rufo-ferruginea, capite obscuriori; antennarum flabello stipite breviori; abdominis segmento ultimo haud emarginato apice vix reflexo.

[Long. $4\frac{1}{5}$ - $5\frac{1}{5}$, lat. $2\frac{2}{5}$ - $2\frac{4}{5}$ lines.

The prothorax has scarcely an indication of a channel down the middle; it is a little more than half again as wide as long, its base (which is feebly bisinuate) being about half again as wide as the front which is deeply emarginate with sharp and well produced angles; it is widest a little behind the middle; the sides are moderately rounded; the hind angles are much rounded but not quite non-existent. The puncturation of the underside is moderately large but neither close nor deep; it is finer than elsewhere on the ventral segments, where in some specimens (usually females) it is somewhat obsolete.

This species is no doubt allied to *S. languida*, Er., which however is said to be "pruinose," and to have its scutellum lævigata (the puncturation of the scutellum is not invariable in *S. dispar*, but I have seen no example in which it is quite lævigata) and the posterior angles of the prothorax "acutiusculi." From the analogy of *S. crosa* there is perhaps a doubt whether the variation of colour is always sexual,—though I have found it so in the specimens,—about a dozen,—that I have examined.

Port Lincoln.

SERICESTHIS EROSA, sp. nov.

♂. Minus elongata; postice leviter dilatata; colore variabilis (nigra, nonnullis exemplis plus minus ferrugineis), nec pruinosa nec iridescens nec velutina; capite confertim fortius, pygidio magis fortiter minus crebre, elytris fortiter vix rugulose, punctulatis; prothorace fortiter vermiculato-rugoso, longitudinaliter sat late sulcato, sulco antice abbreviato; elytris sat manifeste 4-costatis; clypeo antice sat æqualiter rotundato, medio vix sinuato, sat fortiter reflexo; capite postice sat tumido; corpore subtus sparsim subtiliter (metasterno ad latera crebrius fortius excepto) punctulato, sternis ad latera femoribusque pilis sparsis subfulvis vestitis; tibiis anticis extus sat fortiter tridentatis, dente femori proximo quam 2^{us} dimidio minore; tarsis subtus haud lineatim setigeris; tarsorum posticorum articulis primis 2 inter se subæqualibus; antennis 8-articulatis, flabello stipite vix longiori; abdominis segmento ultimo late vix emarginato, apice subreflexo.

[Long. $4\frac{1}{2}$, lat. $2\frac{2}{3}$ lines.

♀. Latet.

Evidently allied to the preceding, from which it does not seem to differ except in respect of such characters as are specified above. It is at once distinguished from all other Australian Sericoid *Melolonthidæ* known to me by the extraordinary close rugulosity of its prothoracic sculpture; it may be noted that the sculpture of the *head* begins to assume this same vermiculate-rugulose appearance in its extreme hinder part. Probably the female does not differ much from the male except in the flabellum of the antennæ being shorter and the apical ventral segment not at all emarginate. The elytra are very evidently less rugulose transversely than those of *S. dispar*, from which the much shorter flabellum of the antennæ in the male is a structural character also strongly differentiating it.

Port Lincoln.

SERICESTHIS PUNCTICOLLIS, sp. nov.

♂. Parum elongata; postice sat dilatata; nigra, pedibus rufis (unico exemplo perspecto), nec pruinosa nec iridescens nec

velutina; capite confertim sat fortiter, prothorace (hoc leviter canaliculato) confertim fortissime, elytris (his manifeste 4-costatis) crasse rugulose, pygidio fortiter minus crebre, punctulatis; clypeo antice sat aequaliter rotundato sat fortiter reflexo; capite postice sat tumido; corpore subtus sparsim minus subtiliter punctulato; sternis ad latera femoribusque pilis subfulvis sparsis vestitis; tibiis anticis extus acute tridentatis, dente femori proximo parvo; tarsis subtus haud lineatim setigeris; tarsorum posticorum articularis primis 2 inter se subaequalibus; antennis 8-articulatis, flabello stipite vix longiori; abdominis segmento ultimo late vix emarginato, apice subreflexo. [Long. 4, lat. $2\frac{2}{3}$ lines (vix).

♀. Rufo-ferruginea; antennarum flabello stipite sat breviori; abdominis segmento ultimo apice haud emarginato.

[Long. $4\frac{1}{2}$, lat. $2\frac{1}{2}$ lines.

Closely allied to the preceding two species; from the former it differs *inter alia* in the much shorter flabellum of the antennæ in the male and in the closer puncturation of the prothorax, the dorsal channel of which is much more defined; from the latter in the much feebler dorsal channel and much less rugulose sculpture of the prothorax, and in the clypeus more evenly rounded in front; it is an evidently shorter and more ovate species than either of them.

S. Australia; Balaclava; also on Yorke's Peninsula.

NOTES ON AUSTRALIAN COLEOPTERA, WITH DESCRIPTIONS OF NEW SPECIES.

BY THE REV. T. BLACKBURN, B.A., CORR. MEM.

PART VIII.

CARABIDÆ.

PHILOPHLÆUS OCCIDENTALIS, sp.nov.

Nitidus ; minus pubescens ; piceus, antennis (basi testacea excepta) capite prothorace et elytrorum marginibus omnibus rufescentibus, palpis femoribusque testaceis ; capite obscure subrugulose punctulato ; prothorace quam longiori fere duplo latiori, antice arcuatim emarginato, lateribus fortiter rotundatis in medio subangulatis utrinque punctis piliferis 4 instructis, angulis posticis vix distinctis subrotundatis, basi bisinuata media parte late leviter lobata ; elytris minus subtiliter minus crebre punctulatis. [Long. 4, lat. $1\frac{4}{5}$ lines.

Maris tarsorum intermediorum articulis basalibus 3 subtus sat spongiosis.

I have seen only a single example of this species which is in the collection of C. French, Esq., Melbourne ; it is therefore possible that the colours may be a little variable. Only one *Philophlæus* has been previously named having the intermediate tarsi of the male as described above, and also the disc of the elytra devoid of markings, viz., *P. immaculatus*, Ohaud. That species can hardly be said to have been described since (according to Baron de Chaudoir's usual fashion) it is simply distinguished from *P. Australasiæ*, which again is simply distinguished from *P. intermedius* and that from *P. australis*. However, working out the calculation

one arrives at the result that *P. immaculatus*, *inter alia*, has the prothorax more strongly lobed behind than *P. australis* and the elytra punctured as in that species. I have examples of an insect (from S. Australia) which presents these characters and which no doubt is *P. immaculatus*. *P. occidentalis* has the prothorax lobed hindward not more strongly than *P. australis*, and the elytra considerably more strongly and less closely punctured. It is the only species of *Philophæus* yet reported from Western Australia except *P. Froggatti*, MacL., (from King's Sound), which is a black species with well defined vittæ on the elytra.

Yilgarn, W. Australia.

PHILOSAPHUS DUBOULAYI, sp. nov.

Niger; capite prothorace sat angustiori hic illic sat fortiter arcuatim rugato, sulcis frontalibus postice sat fortiter divergentibus; prothorace fortiter sat crebre transversim rugato, canaliculato, quam longiori fere duplo latiori, antrosum nullo modo angustato, angulis anticis sat productis subacutis posticis nullis, marginibus (antico excepto) sat late reflexis continuis postice trisinuatis (sinu intermedio subobsoleto); elytris quam prothorax paullo angustioribus, sat planatis, juxta suturam depressis, intra marginem lateralem unicarinatis; minute sat crebre granulatis, granulis longitudinaliter subseriatim dispositis, inter has hic illic granulis majoribus (4- vel 5-seriatim vix distincte dispositis) dispersis; tibiæ anticarum dente externo tertio (ab apice enumerato) valde minuto. [Long. 12, lat. 4½ lines.

This species is much like *P. tuberculatus*, MacL., (of which I owe a fine example to the kindness of Mr. T. G. Sloane of Sydney whose determinations of Australian *Carabidæ* can I believe be thoroughly relied on, he having made an especial study of them; the example in question agrees very well with Sir W. Macleay's description). From *P. tuberculatus* the present species differs chiefly as follows:—(a) the elytra are narrower in comparison with the prothorax, being by measurement *actually* (about as 11

to $11\frac{3}{4}$) narrower than the latter segment whereas in *P. tuberculatus* the greatest width of the elytra seems to be exactly the same as of the prothorax ; (b) the elytra are very differently sculptured, —those of *P. tuberculatus* each bear 4 well defined rows of large flat feebly raised tubercles, inside which is a less defined row along the suture and outside which are two fairly defined rows of smaller tubercles, while a few minute granules are irregularly scattered here and there among the interspaces of the tubercles ; the elytra of *Duboulayi* bear a great number of small tubercles (or rather large granules the largest of which are much smaller than the large tubercles of *P. tuberculatus*) which are scattered irregularly over the surface, and of these a few stand out here and there as evidently larger than the others,—these larger granules (or small tubercles) having a tendency to run into irregular interrupted longitudinal rows two of which are fairly well defined and more conspicuous than the rest ; (c) the 3rd tooth on the front tibiæ (counting upwards from the apex) is as small as the minute denticulation that is placed in *P. tuberculatus* higher up than the similar (*i.e.* 3rd) tooth.

N. Queensland ; presented to me by F. Duboulay, Esq.

STENOLOPHUS CÆRULEUS, sp.nov.

Oblongus ; niger, elytris læte cæruleo-iridescentibus, antennis (parte apicali obscuriori excepta) palpis pedibus et marginibus lateralibus testaceis, sutura rufescenti ; capite sat brevi, convexo, postice æquali, inter antennis linea subtili transversa angulata impresso ; prothorace elytris minus angustiori, sat transverso, subquadrato, trans partem basalem subfortiter punctulato, canaliculato, canali antice et postice fortiter abbreviato, lateribus leviter rotundatis, angulis anticis obtusis, posticis rotundatis ; elytris subtilius striatis, stria abbreviata prope scutellum sat elongata, interstitiis sat planis postice elevatioribus, 3° apicem versus puncturam singulam ferenti.

[Long. $2\frac{2}{3}$, lat. 1 line (vix.)

With the facies of *Harpalus* this pretty little species combines the bisetose penultimate joint of labial palpi and bilobed 4th tarsal

joint of *Stenolophus*, with which genus the vestiture of the dilated tarsal joints of the male quite agrees.

N. Territory of S. Australia ; taken by Mr. Hedbloom.

ACUPALPUS MORGANENSIS, sp. nov.

Elongatus, sat parallelus ; niger, prothorace paullo rufescenti, elytris nonnihil viridi micantibus, antennarum basi palpis pedibusque pallide testaceis, marginibus lateralibus et elytrorum sutura rufis testaceisque ; capite inter oculos utrinque sulcula arcuata impresso ; prothorace elytris parum angustiori parum transverso, postice paullo angustato, canaliculato, utrinque basin versus impresso, parte impressa subfortiter punctulata, lateribus leviter rotundatis, angulis anticis vix productis, posticis rotundato-obtusis ; elytris sat fortiter striatis, stria abbreviata prope scutellum nulla, interstitiis sat planis, 3° pone medium puncturam singulam ferenti.

[Long 2, lat. $\frac{7}{10}$ line.

A very elongate narrow species which I place provisionally in *Acupalpus* on account of the following characters in combination, penultimate joint of labial palpi bisetose, front and middle tarsi of male dilated (the vestiture of the under surface consisting of long hair-like scales thinly placed,—this is not quite accordant with *Acupalpus*) the 4th tarsal joint not bilobed. I do not suppose that it can remain permanently in *Acupalpus*,—indeed the vestiture of the male tarsi (which is almost like that of *Leptopodus* or *Simodontus* in the *Feronides*) together with the absence of a scutellar elytral stria might justify my giving a new generic name at once, —but there are doubtless so many more small Australian *Harpalides* yet to be discovered than have hitherto been described that it seems to me wiser for the present to refer new species as much as possible to the old genera and leave the generic question to be dealt with less piecemeal,—a course which will not mislead so long as generic peculiarities are carefully recorded when describing the species, and it is merely the creation of a new name that is omitted.

BRADYCELLUS PROMTUS, Er.

A species which corresponds very fairly with Erichson's description of *Harpalus promptus* and which appears to have all the essential characters of *Bradycellus* (to which the Baron de Chaudoir refers that insect), is not uncommon in S. Australia. It varies a good deal in colouring,—the dark parts in numerous examples (perhaps more or less immature) being reddish or pitchy-red.

HARPALUS CONVEXIUSCULUS, MacL.

Sir William Macleay's statement that the prothorax in this species has its lateral margins "furnished with several setigerous punctures" suggests the probability of its belonging to the *Feronides* rather than the *Harpalides*.

LAMELLICORNES.

HETERONYX YILGARNENSIS, sp.nov.

Minus elongatus ; sat convexus ; postice leviter dilatatus ; sat nitidus ; ferrugineus, antennis testaceis ; pilis minus brevibus suberectis fulvis sat dense vestitus ; capite confertim crasse rugulose, prothorace sat fortiter sat crebre, elytris quam prothorax vix fortius minus crebre, pygidio (hoc longe hirsuto) sat fortiter vix crebre, punctulatis ; tibiaram anticarum dentibus externis validis ; labro clypeum minus late minus fortiter superanti ; antennis 8-articulatis ; unguiculis appendiculatis. [Long. 6, lat. $3\frac{1}{8}$ lines.

The head scarcely differs from that of *H. piger*, Blackb., except in the clypeus being a little less emarginate anteriorly, so that the trilobed outline of the head is slightly less developed. The prothorax is very nearly double as wide as long (i.e. as 13 to 7), its base slightly more than half again as wide as its front which is moderately emarginate with angles very little produced ; the sides (viewed from above) appear to be somewhat straight in the hinder half, thence to converge arcuately to the front and to form right

angles (but not very sharply so) with the base which is gently bisinuate and but little lobed in the middle. The elytra scarcely show a trace of even a sutural stria; their transverse wrinkling is well developed, their lateral fringe normal, their apical membrane distinct. The puncturation of the upper surface resembles that of *H. constans*, Blackb., but is markedly coarser throughout. The hind femora are moderately wider than the intermediate, their inner apical projection being well developed but quite widely rounded. The hind coxæ are considerably shorter than the metasternum and much longer than the second ventral segment. The metasternum is rather strongly punctured all across,—more closely at the sides than in the middle, the hind coxæ still more strongly, with the antero-internal region lævigata. The ventral segments are punctured pretty strongly and closely at the sides but the puncturation is very feeble in the middle. The ventral series consist of rather stout bristles and are not very conspicuous. The teeth of the anterior tibiæ are very long and robust, the uppermost being somewhat more than half the size of the intermediate. The apical piece of the hind claws is scarcely shorter than the basal piece, of which the apical projection is very slight.

In the tabulation (P.L.S.N.S.W., 1889, pp. 141, &c.), this species will take its place under "F" at the top of p. 143 in company with *H. nigellus* and *dubius* from both of which it is distinguished *inter alia* by its much larger size.

Yilgarn, W. Australia; sent to me by C. French, Esq.

HETERONYX PUNCTICOLLIS, Blackb.

I have received from Mr. Froggatt several specimens taken near Sydney, which I refer with some doubt to this species; the clypeal suture is much less defined than in the Victorian type, the whole surface of the head being almost an even plane, and the general puncturation seems slightly closer and stronger, but they agree so well in the unusual relative puncturation of prothorax and elytra, and in the peculiar front tibiæ as well as in structural characters generally that I cannot bring myself to separate them.

HETERONYX NITIDUS, sp. nov.

Minus elongatus; minus convexus; postice leviter dilatatus; nitidus; supra setulis brevissimis erectis sparsim vestitus; ferrugineus, antennis palpisque dilutioribus; clypeo (hoc brevissimo) confertim rugulose, capite postice sat fortiter sat crebre, prothorace sat fortiter vix crebre, elytris leviter squamose sat crasse sat crebre, pygidio (hoc longe hirsuto) minus fortiter sat sparsim, punctulatis; tibiaram anticarum dentibus externis sat validis; labro a clypeo oblecto; antennis 8-articulatis; unguiculis appendiculatis. [Long. 4, lat $2\frac{1}{2}$ lines.

This species belongs to the 1st Section of the genus, and in the tabulation given in my "Revision" (P.L.S.N.S.W., 1888, p. 1328) would fall side by side with *H. frontalis*, mihi, which it very closely resembles,—indeed after a very careful examination I can specify only the following distinctive characters; *H. nitidus* is very much the smaller species, its clypeus is (not evenly rounded but) a little flattened or subtruncate in front, the puncturation of its prothorax is a little more sparse, and that of its elytra consists (not of isolated well defined punctures but) of obscure blurred-looking punctures which from some points of view seem to be almost lost in obscure rugulosities of the surface. The short erect hairs on the upper surface are not at all noticeable until carefully looked for, and I do not like to specify their presence as a mark of distinction from *H. frontalis* because I think it possible that they might be present in a fresh specimen of the latter. There is no doubt of the specific distinctness of the two,—which is confirmed by the very wide divergence of the localities in which they have been found.

Yilgarn, W. Australia; sent to me by C. French, Esq.

HETERONYX SYDNEYANUS.

Elongatus; postice vix dilatatus; minus nitidus; pallide ferrugineus, antennis palpisque testaceis; pilis minus brevibus adpressis minus sparsim vestitus; clypeo crasse rugulose, capite postice pygidioque subfortiter sparsius, prothorace et

elytris crebre subtilius, punctulatis; labro clypeum sat late minus fortiter superanti; antennis 9-articulatis; unguiculis appendiculatis; unguiculorum posticorum parte basali apicali sat longiori, apice sat acute producta; coxis posticis metasterno vix brevioribus; elytrorum membrana apicali valde producta. [Long. $3\frac{1}{2}$, lat. $1\frac{3}{5}$ lines/

In my tabulation of the species of *Heteronyx* having the labrum elevated above the clypeus, the antennæ 9-jointed, and the claws appendiculate (P.L.S.N.S.W., 1889, pp. 662-668) there might be a doubt whether the present species should be placed under "C" on p. 664 (as having close fine and even puncturation) or under "CC" on p. 666 (as having the puncturation less fine and close) as in "C" it would be a little sparsely punctured and in "CC" a little closely. I should refer it to the latter group. If, however, it were referred to "C" it would stand under "GG" p. 666, along with *subferrugineus*, Burm., from which it is very distinct indeed *inter alia* by its utterly different puncturation,—e.g., the metasternum having a well defined moderately close and strong puncturation on a nitid derm. If referred to "CC" it would stand along with *posticalis*, Blackb., under "FF" p. 667 from which it differs *inter alia* by having the basal joint of the hind tarsi not shorter than the second; the apical membrane of its elytra, however, though quite exceptionally developed, is not quite so sharply defined as in *posticalis*. The labrum of the single example before me is strongly hollowed out so that when the trilobed outline of the head is examined the middle lobe appears concave (if this be not an individual peculiarity it will at once distinguish the species from almost every other in the genus). Taking all characters into account the present species is I think nearest to *H. longulus*, Blackb., which it closely resembles in respect of puncturation (the punctures being however a trifle finer and closer than in that species); apart from characters already mentioned it differs, however, in not having the suture of the elytra carinate behind and distinctly produced at the apex. From *flavus* this insect differs *inter alia* by the well defined uppermost

tooth of the 3 on the front tibiæ, and from *angustus* (which it closely resembles in puncturation) by the basal joint of the hind tarsi being evidently longer than the 2nd joint.

N.S. Wales ; near Sydney ; sent to me by Mr. Froggatt.

TEINOGENYS INERMIS, sp. nov.

Supra niger, nitidus ; subtus dense longe fulvo-pubescens, antennis pedibusque rufo-brunneis ; capite antice confertim rugulose, postice sparsim, punctulato ; prothorace sat sparsim subfortiter (fere ut capitis pars postica), scutello leviter sat crasse, punctulato ; elytris fortiter vix æqualiter punctulato-striatis, striis apicem versus vix obsolescentibus ; pygidio antice (hic longe sparsim hirsuto) sat crebre, postice sparsius, punctulato. [Long. $6\frac{1}{2}$, lat. $3\frac{3}{4}$ lines.

♂. Capite haud tuberculato ; vertice a clypeo carina sat elevata distincto ; prothorace antice utrinque vix manifeste impresso, quam longiori fere duplo latiori, quam elytra paullo angustiori ; antennarum clava quam capitis latitudo vix longiori, lamellis apicem versus rotundatim angustatis, quam latioribus triplo longioribus.

Although the presence of a frontal tubercle in the male is mentioned by Dr. Sharp as one of the generic characters of *Teinogenys* I have no hesitation in referring the present species to that genus with which it seems to agree very well in other respects. On a casual glance the surface of the prothorax appears to be quite even, but when more carefully examined there appears a small feeble depression near the front on either side of the middle.

Yilgarn, W. Australia ; sent to me by C. French, Esq.

ELATERIDÆ.

MONOCREPIDIUS ANGUSTIPES, sp. nov.

Piceo-niger, antennis palpis pedibusque testaceis ; brevissime subaureo-pubescens ; capite antice planato ; prothorace quam trans angulos posticos latiori haud longiori, confertim fortius punctulato, postice in medio vix manifeste canaliculato,

lateribus leviter arcuatis, angulis posticis sat elongatis bicarinatis, leviter divaricatis; elytris fortiter punctulato-striatis, leviter (apicem versus fortius) convexis subtilissime punctulatis, apice suturali vix prominente; tarsorum lamella quam latiori multo longiori, apice angustata, prothoracis margine laterali haud in prosternum subducto.

[Long. 8, lat. 2 lines.

A somewhat exceptional species through the shape of the lamella on the tarsi which is very narrow and elongate and (instead of being truncate at the apex) is narrower at the apex than in the middle, the apical margin being rounded. The true lateral margin of the prothorax (when surveyed from a point perpendicularly above the middle of the base) is not hidden (close to the apex of the hind angle) by the external keel. The puncturation of the head is rather strong and a little rugulose; on the prothorax the puncturation in front is almost similar, but becomes gradually finer towards the sides and base. From some points of view the prothorax appears obsoletely keeled down the middle line.

W. Australia; Israelite Bay; in the collection of Mr. French (Victorian Colonial Entomologist).

MACROMALOCERA AFFINIS, sp. nov.

♂. Elongata; fusca; breviter fulvo-pubescent; antennarum (corpori longitudine æqualium) articulo 3° 2° fere duplo longiori; prothorace quam trans medium latiori manifeste longiori, trans basin quam trans medium tertia parte latiori, confertim punctulato, vix inæquali, lateribus anguste marginatis ab angulis anticis fere ad basin subparallelis; elytris leviter punctulato-striatis, antice utrinque fortiter lobato-productis.

[Long. 8, lat. 2 lines (vix).

Of this genus,—remarkable among the *Elaterides* for the great length of the antennæ of the male, and the shortness of those of the female (which do not reach the base of the prothorax), as well as for other exaggerated sexual differences,—two species were

described by the Rev. F. W. Hope in 1833, and none, I believe, have been added since. The present species is extremely close to those of Mr. Hope but differs from them both, besides in some other characters less striking, by the 3rd joint of the antennæ being nearly twice as long as the 2nd—those joints being stated by Mr. Hope to be of the same length in his species. In *M. affinis*, the colour is almost uniform,—a pale brownish-yellow, which becomes a trifle more decidedly yellow very narrowly along the suture.

I have seen a female example of this genus (also from Central Australia) evidently belonging to another distinct species, but I do not think well to describe it without having the male before me.

Charlotte Waters; Central Australia; in the collection of the S. Australian Museum.

MACROMALOCERA SINUATICOLLIS, sp.nov.

♂. Elongata; fusca, antennis pedibus et elytrorum sutura lateribusque flavis; breviter fulvo-pubescens; antennis corpori longitudine æqualibus, articulis 2° 3° que inter se æqualibus; prothorace quam trans medium latiori haud longiori, trans basin quam trans medium multo minus tertia parte latiori, confertim punctulato, valde inæquali, lateribus sat late reflexis (pone angulos anticos sat rotundatis, hinc retrorsum externe concavis); elytris leviter punctulato-striatis, antice utrinque vix lobato-productis. [Long. $8\frac{1}{2}$, lat. 2 lines.

♀ differt antennis prothorace haud longiori, prothorace quam longiori manifeste latiori, elytris medium versus quam ad basin manifeste latioribus. [Long. $10\frac{2}{3}$, lat. $2\frac{3}{5}$ lines.

This species differs from the description and figure of *M. ceramboides* ♂, Hope, in colour (that insect being uniformly flavous except the scutellum which is black) and in the shape and uneven surface of the prothorax. From *cænosa*, Hope (as redescribed by M. Candèze,—Mr. Hope's description is merely of two lines mentioning the colours) the insect before me differs in size and in the shape of the prothorax, which in *cænosa* is said to be

longer than wide, and to be "straight and parallel on the sides in front,"—whereas in *M. sinuaticollis* the sides are quite strongly arched immediately behind the anterior angles and then are incurved hindward until they diverge again close to the base where they run into the produced hind angles. The prothorax is at its widest (disregarding the actual hind angles) immediately behind the front margin. From *M. affinis* this species differs in the shape of the prothorax (which in the former is almost straight and parallel on the sides),—in the less elongate hind angles of the same (in *M. affinis* these are produced in a remarkably long and slender lobe), in the 3rd joint of the antennæ not being longer than the 2nd and in the anterior margin of the elytra being much less strongly arched forward on either side of the scutellum.

W. Australia ; Israelite Bay,—from Mr. C. French.

TENEBRIONIDÆ.

HYPOCILIBE.

I have before me ten examples from various localities apparently belonging to this genus and *Onosterrhus*. *Hypocilibe* and *Onosterrhus* seem to be very closely allied and I find considerable difficulty in drawing the line between the two genera. Mr. Bates distinguishes the former from the latter by its more expanded and less convex form, the more deeply sulcate gula, the large cultriform joint of the maxillary palpi (the same in *Onosterrhus* being "triangulate"), "etc." Looking through the description to find what "etc." refers to I can only discover the following,—that the tooth of the submentum is larger in *Hypocilibe*, and the sides of the epistoma more parallel. Referring to the descriptions of the species that have been attributed by the author of *Hypocilibe* (or recognised by him as belonging) to either genus, it would seem that the species of *Onosterrhus* are longer than wide while in *Hypocilibe* the proportions are reversed.

When I endeavour to apply these observations to the specimens before me I find that in four of them the length and width are

equal,—in four the width greater than the length,—and in two the length greater than the width. Beyond this I cannot find any constant distinction; of the two narrow specimens one certainly has the gular sulcus feeble, but the other has not; some of the wider examples have the teeth of the submentum no larger than one of the narrower examples, and so on.

As there is, I think, no doubt that some at least of the wider examples before me would be referred by Mr. Bates to *Hypocilibe*, and, as I cannot separate the ten examples into two genera, I must refer them all to *Hypocilibe* on the supposition that either I have not seen a real *Onosterrhus* or the distinction of the genera cannot be maintained,—in which latter case of course the name *Hypocilibe* would have to be dropped. I should have little hesitation in accepting the former alternative were it not for a remark by Mr. Bates himself (E.M.M., Aug., 1873), on the paucity of material for the study of *Onosterrhus* and the possibility of modifications being required when more specimens could be examined. One character puzzles me extremely, and that is the relation between the metasternum and its episterna. In some examples the suture between these is straight and in others more or less curved; this does not appear to be sexual nor even specific; in examples with glabrous tibiæ and short anterior tarsi both forms are to be found, and in one of the two examples described below as *H. lugubris* (which I am convinced are one species) the suture is less straight than in the other.

HYPOCILIBE MAJOR, sp.nov.

Sat late ovata; sat convexa; sat nitida; nigra, antennis palpis pedibusque picescentibus, tarsis subtus et tibiæ apice summo auricomatis; capite et segmentis ventralibus (sub lente forti) subtiliter minus crebre, prothorace vix manifeste, segmentis ceteris (his minute coriaceis) haud, punctulatis; prothorace quam longiori fere duplo latiori; postice quam antice plus dimidio latiori, antice profunde arcuatim emarginato, latitudine majori pone medium posita, lateribus postice leviter sinuatis, angulis omnibus sat acutis; elytris prothorace

tertia parte latioribus, postice haud abrupte declivibus, supra subopacis lineis sat nitidis haud elevatis reticulatum notatis; tibiis posticis haud intus pilosis; tarsorum articulis singulis basin versus fortiter angustatis. [Long. 11, lat. 6 linea.

The large size of this species and the very deep concavity of the front margin of its prothorax seem to be its most striking characters. Unfortunately the group of genera in which *Hypocitide* finds a place does not contain a common and well known species with which to compare new forms, and there is nothing really gained by comparing a new species with one that exists perhaps only in a single collection. It will be better therefore to indicate the degree of concavity of the front of the prothorax by measurement; the length of the prothorax down the middle is $2\frac{7}{10}$ lines, while the distance between the apices of the anterior and posterior angles is $3\frac{1}{2}$ lines, and the middle of a line joining the apices of the two front angles would be quite $\frac{1}{2}$ line distant from the middle of the front of the prothorax. The gular sulcus is fairly strong; the submentum is deeply sulcate or notched longitudinally; the front margin of the prosternum is minutely prominent in the middle; the front and middle coxæ are somewhat ferruginous and the anterior part of their surface is strongly strigose; the absence of a line of pubescence along the inner face of the hind tibiæ is probably a sexual character. The basal three ventral segments are wrinkled longitudinally. The teeth of the submentum are extremely robust and strongly produced. The row of punctures close to the margin of the elytra is scarcely indicated; all the tibiæ are a little pubescent at the extreme apex. The surface of the prosternum is evenly convex down the middle, with two striæ on each side, and the apex is distinctly bifid. The front and hind tarsi are shorter than, the intermediate quite equal to, their tibiæ. The individual joints of the tarsi are narrowed from the apex to the base almost as in many *Carabidæ* (e.g. *Catadromus*). The basal joint of the front tarsi is about twice as long as the 2nd joint.

Yilgarn, W. Aust.; sent to me by C. French, Esq.

HYPOCILIBE LÆTA, sp.nov.

♂. (?) Oblonga; sat convexa; minus nitida; piceo-brunnea, capite et segmentis ventralibus (sub lente forti) sparsim subtiliter, segmentis ceteris vix manifeste, punctulatis; prothorace quam longiori tribus partibus latiori, postice quam antice vix dimidio latiori, antice sat profunde arcuatim emarginato, latitudine majori vix pone medium posita, lateribus sat rotundatis haud sinuatis (nisi ad angulos posticos ipsos), angulis posticis fortiter anticis vix acutis; elytris prothorace vix plus 5^a parte latioribus, postice minus abrupte declivibus; tibiis posticis lineatim, intermediis dense late, intus tomentosus. [Long. 10, lat. 5 lines.

The length of the prothorax down the middle is $2\frac{1}{2}$ lines, while the distance between the apices of the anterior and posterior angles is $2\frac{3}{4}$ lines, and the middle of a line joining the apices of the two front angles would be scarcely $\frac{2}{3}$ line distant from the middle of the front of the prothorax. The gular sulcus and the submentum scarcely differ from those of *H. major*, except in the latter being less strongly sulcate longitudinally. The prosternum is not prominent in front. The front and middle coxæ are distinctly punctulate in front. The row of punctures close to the margin of the elytra in the anterior half is not very well marked. The lateral gutter of the prothorax is wide and well marked (more distinctly than in *H. major*) and that of the elytra is very narrow but of even width to the apex,—in *H. major* wider in front but narrowing much hindward. The basal three ventral segments are wrinkled longitudinally. The sides of the prothorax are evenly rounded except in the hinder angles being a little directed outwards,—in *H. major* they are distinctly sinuate before the hind angles. The surface of the prosternum is a little flattened down the middle, with two striæ on each side, and the apex is rounded. The basal joint of the front tarsi is channelled down the middle and is (viewed from above) scarcely twice (viewed from below, about three times) as long as the 2nd joint, and

is scarcely wider than it. The suture between the metasternum and its episterna is arched.

S. Australia ; interior.

N.B.—In the South Australian Museum there is a specimen (devoid of tarsi and antennæ) which I am disposed to regard as the female of this species. It differs from my own example in being more nitid and of a reddish testaceous colour (possibly immature), in the marginal row of elytral punctures being stronger, in the tibiæ not being tomentose, in the sutures between the metasternum and its episterna being straight, in the elytra being devoid of wrinkles, and in the prosternum being depressed between the coxæ (possibly owing to immaturity).

HYPOCILIBE ROTUNDATA, sp. nov.

♂ (?) Late ovata ; supra minus, subtus plus, nitida ; piceo-nigra, elytris brunnescentibus ; capite sparsim subtilissime, segmentis ventralibus subtiliter sat crebre, segmentis ceteris vix manifeste, punctulatis ; prothorace quam longiori duplo latiori, postice quam antice plus duabus partibus latiori, antice arcuatim sat profunde emarginato, latitudine majori vix pone medium posita, lateribus sat rotundatis postice (nisi ad angulos posticos ipsos) vix sinuatis, angulis omnibus sat acutis ; elytris prothorace tertia parte latioribus, postice minus abrupte declivibus ; tibiis posterioribus intus lineatim tomentosus. [Long. 10. lat. $6\frac{1}{2}$ lines.

The length of the prothorax down the middle is $2\frac{2}{3}$ lines, while the distance between the apices of the anterior and posterior angles is $2\frac{1}{3}$ lines, and the middle of a line joining the apices of the two front angles would be scarcely $\frac{1}{2}$ line distant from the middle of the front of the prothorax. The gular furrow and submentum resemble those of *H. major*. The prosternum is slightly bisinuate in front,—behind it is like that of *H. leta* but is somewhat rugulose. The anterior coxæ are punctulate, the intermediate strigose. The row of punctures close to the margin of the elytra is scarcely indented. The lateral gutter of the prothorax is wide and

well-defined, as in *H. læta*, and that of the elytra is narrow, (somewhat narrower than in *H. major*) and but little attenuated behind. The elytra have strongly rounded sides and at their widest (slightly in front of the middle) are together almost as wide as long (about as 8 to 9); their surface bears a widely meshed reticulation of fine scratch-like wrinkles. The sutures between the metasternum and its episterna are straight. The front tarsi are wanting in my specimen.

N.S. Wales; Lachlan River; sent to me by Mr. T. G. Sloane.

HYPOCILIBE SCULPTURATA, sp.nov.

♂ (?) Ovata, elytris subgibbosis; supra minus, subtus plus, nitida; nigra, certo adpectu subviolacea, antennis palpis pedibusque vix picescentibus; capite sparsim subtilissime, prothorace vix manifeste, elytris sparsim leviter sat minute (quam caput multo fortius), segmentis ventralibus (horum basalibus 3 longitudinaliter rugatis) sparsim (segmentis basalibus 3 sparsissime) subtilissime, punctulatis; prothorace quam longiori duplo latiori, postice quam antice fere duabus partibus latiori, antice modice minus arcuatim emarginato, latitudine majori fere ante medium posita, lateribus minus rotundatis postice leviter sinuatis, angulis anticis vix, posticis sat manifeste, acutis; elytris prothorace vix plus quarta parte latioribus, postice modice declivibus, longitudinaliter vix 3-costatis; tibiis posterioribus intus lineatim tomentos.

[Long. 8, lat. $5\frac{1}{2}$ lines.]

The length of the prothorax down the middle is not quite 2 lines, while the distance between the apices of the anterior and posterior angles is $2\frac{2}{3}$ lines and the middle of a line joining the apices of the two front angles would be a little more than $\frac{1}{2}$ line distant from the middle of the front of the prothorax. The gular furrow and submentum are almost as in the preceding species. The prosternum is very evenly emarginate in front; behind it is flattened, bistriate at the sides, and truncate at the apex. The anterior coxæ are smoothly, the anterior rugulosely, punctulate. The row of punctures close to the margin of the elytra is well defined and

can be traced to a little distance behind the middle. The lateral gutter of the prothorax is wide and fairly defined and that of the elytra is as in *H. rotundata* except in not being at all narrowed behind, but rather the reverse owing to a little flattening out of the apical part of the elytra. The elytra are very peculiar being strongly convex towards the front both laterally and longitudinally so that their greatest height (viewed from the side) is very near the front; they have a triangular depression behind the scutellum as in *Nyctozoilus* and their surface is evidently (though widely and feebly) prominent in three longitudinal lines on each side of the suture which itself forms an additional and similar prominence; their sides are moderately rounded and are at their widest slightly in front of the middle. The suture between the metasternum and its episterna is nearly straight. In the example before me only two joints of a front tarsus are extant; these are both shorter than is customary in specimens with tomentose hinder tibiae; the basal joint is channelled beneath like the 2nd than which it appears above quite twice and below quite three times longer.

Australia; sent to me by Mr. T. G. Sloane; exact habitat uncertain.

HYPOCILIBE LUGUBRIS, sp. nov.

Ovata, sat convexa; nigra, palpis antennarum parte apicali et tarsis plus minus picescentibus vel rufescentibus, tarsis subtus et tibiis apice summo auricomatis; supra (labro sub nitido sparsim punctulato excepto) sat opaca, coriacea, capite prothoraceque vix manifeste punctulatis; subtus sat nitida; segmentis ventralibus sparsim subtiliter punctulatis, basalibus 3 longitudinaliter rugatis; prothorace quam longiori paullo minus duplo latiori, postice quam antice circiter dimidio latiori, antice minus profunde subarenatim emarginato, latitudine majori fere in medio posita, lateribus sat rotundatis pone medium vix sinuatis, angulis omnibus parum acutis, posticis minime productis; elytris prothorace 4^a parte latioribus; tarsorum articulis singulis basin versus parum angustatis.

[Long. 8 (vix), lat. 4 lines.

Maris (?) tarsorum anticorum articulis basalibus 4 sat elongatis, 1° 2° fere duplo longiori et latiori, subtus haud sulcato; tibiis posticis intus pilis aureis seriatim vestitis, elytris sparsim leviter punctulatis, hic illic longitudinaliter undatim rugatis.

Feminæ (?) tarsorum anticorum articulis basalibus 4 brevibus subæqualibus, tibiis posticis intus haud pilosis, elytris haud punctulatis.

The length of the prothorax down the middle is $1\frac{4}{5}$ lines, while the distance between the apices of the anterior and posterior angles is $2\frac{2}{5}$ lines (vix) and the middle of a line joining the apices of the two front angles would be about $\frac{3}{10}$ line distant from the middle of the front of the prothorax. The gular sulcus is narrower and less profound than in the preceding two species, the submentum being scarcely different from that of *H. læta*. The prosternum is not prominent in front, its hinder part being more or less flattened down the middle with a strong stria on either side outside which the edge is turned up (more strongly in one example than in the other),—the hinder extremity not bifid. The front and intermediate coxæ are distinctly punctulate. The row of punctures close to the margin of the elytra is well marked in one of the examples before me and can be traced almost to the apex; in the other example it is much feebler (more so on one elytron than on the other). The lateral gutter of the prothorax is well defined; from a certain point of view a flat gutter is apparent much wider than the thickened margin of the prothorax and well limited; that of the elytra is reduced to a mere stria-like impression within the narrow thickened edge of the elytron but is a trifle wider near the apex.

I feel scarcely any doubt of the two examples before me being male and female of one species. They were taken under stones close to each other and only differ *inter se* as specified above.

S. Australia; about 40 miles North of Port Lincoln.

HYPOCILIBE INCONSPICUA, sp. nov.

Ovata; sat convexa; nigra, palpis antennarum parte apicali et tarsis plus minus piceascentibus vel rufescentibus, tarsis subtus et tibiæ apice summo auricomatis; supra (labro sat nitido sparsim punctulato excepto) sat opaca coriacea vix manifeste punctulata; subtus sat nitida lævigata; segmentis ventralibus basalibus 3 longitudinaliter rugatis; prothorace quam longiori fere duplo latiori, postice quam antice minus dimidio latiori, antice minus profunde subsinuatum emarginato, latitudine majori fere in medio posita, lateribus sat rotundatis pone medium vix sinuatis, angulis omnibus parum acutis, posticis minime productis; elytris prothorace 4^a parte latioribus; tarsorum articulis singulis basin versus parum angustatis.

Maris (?) tarsorum anticorum articulo 1° 2° duplo longiori, tibiis posticis intus pilis aureis seriatim vestitis.

[Long. $7\frac{1}{2}$, lat. 4 lines.

The length of the prothorax down the middle line is $1\frac{1}{2}$ lines while the distance between the apices of the anterior and posterior angles is scarcely 2 lines and the middle of a line joining the apices of the two front angles would be scarcely more than $\frac{1}{2}$ line distant from the middle of the front of the prothorax. The gular sulcus is narrower and less profound than in the preceding three species and forms a more evenly curved line, the submentum being scarcely different from that of *H. lata* except in its lateral projections being perhaps a trifle less strong. The prosternum is not prominent in front, its hinder part being convex down the middle with a strong stria on either side and the hind apex scarcely bifid. The front coxæ are distinctly, and the intermediate scarcely, punctulate. The row of punctures close to the margin of the elytra is well marked and can be traced almost to the apex. The lateral gutter of the prothorax is scarcely defined,—the general convexity of the upper surface continuing almost evenly to the thickened lateral margin; that of the elytra is reduced to a mere stria-like impression within the narrow thickened edge of the elytron, but is a trifle wider near the apex.

Very similar to *H. lugubris* in general appearance but at once distinguished from the corresponding sex of that species by the basal joint of the front tarsi being (like the other joints) channelled beneath, and being scarcely wider than the 2nd joint;—also distinguished by the impunctate ventral segments. From *H. major* and *læta* it differs *inter alia* by the feeble emargination of the front of its prothorax and the absence (from all points of view) of a distinct gutter on the prothorax immediately within the thickened margin.

S. Australia ; near Port Lincoln.

STYRUS.

Of this genus I have before me two species. One of them is pretty certainly *S. elongatulus*, Bates (which I have no doubt its author is right in considering identical with *Nyctozoilus elongatulus*, MacI.). The only points on which I hesitate as to the correctness of my identification are that in my example the head and prothorax are more even than Mr. Bates describes them, and the smooth space on the disc of the latter (mentioned by Mr. Bates) is scarcely indicated, while at the same time I should scarcely call the puncturation of the ventral segments “fine,” although it agrees with Mr. Bates’ description in being much finer than that of the underside of the head and of the flanks of the prothorax. Discrepancies so small would perhaps hardly be worthy of remark in respect of most descriptions, but the descriptions of Mr. Bates are so remarkably full and accurate that *any* discrepancy suggests a doubt.

STYRUS CLATHRATUS, sp. nov.

Elongatus ; subovatus ; brunneo-niger ; elytrorum costis (nec prothoracis marginibus) nitidis ; capite confertim subtiliter rugulose punctulato, postice longitudinaliter canaliculato ; prothorace quam longiori quarta parte latiori, toto (canalibus lateralibus inclusis) ut caput punctulato, postice quam antice vix quarta parte latiori, in medio obscure interrupte carinato, antice utrinque longitudinaliter obscure 4-sulcato, ante basin transversim fortiter bisinuatim sulcato, angulis anticis (his

fortiter productis) et posticis (his minoribus) sat acutis, lateribus crenulatis; elytris reticulato-costatis, interspatiis fortiter sparsim punctulatis; segmentis ventralibus metasternoque (sub lente forti) creberrime subtilissime punctulatis et sat crebre subtiliter granulatis, certo adpectu subtiliter transversim strigatis; capite subtus crasse sat crebre, prosterni lateribus sparsim minus fortiter punctulatis.

[Long. 6, lat. $2\frac{1}{2}$ lines.

May be at once distinguished from *S. elongatulus*, *inter alia*, by the totally different sculpture of the under surface.

Victoria; sent to me by Mr. T. G. Sloane.

ADELIUM OCCIDENTALE, sp. nov.

Oblongum; minus convexum; nigrum (vix seneo-micans), antennis (apicem versus) tarsisque vix picescentibus, his subtus (et tibiis apicem versus intus) dense auricomatis; antennis sat elongatis sat gracilibus apice vix dilatatis, articulo 3^o sequentibus 3 conjunctis vix breviori; capite prothoraceque minus crebre sat subtiliter punctulatis; hoc elytris parum angustiori, quam longiori duplo latiori (latitudine majori mox pone medium posita), antice quam postice paullo angustiori, lateribus sat late deplanatis impunctulatis rotundatis, angulis anticis sat productis, posticis minutis acute rectis; elytris fortiter punctulato-striatis, interstitiis impunctulatis sat convexis apicem versus in tuberculis (seriatim positis) ruptis; abdominis processu intercoxali lato haud marginato antice rotundato-truncato.

[Long. 10, lat. 4 lines.

The form of the intercoxal process of the hind body and the length of the 3rd joint of the antennæ would place this species in the same section of *Adelium* (as subdivided by M. Blessig) as *tenebrioides*, Er., *porcatum*, Fab., &c. The elytra exceeding the prothorax in width by only about $\frac{1}{6}$ the width of the latter, together with the feebly punctured prothorax, large size, and almost black colour, will distinguish it from all its allies. In one

of the examples before me the prothorax bears some obscure large impressions on either side of the middle which are scarcely visible in the other example. The epipleuræ of the elytra are almost lævigatae.

S. Australia (Fowler's Bay) and W. Australia (Israelite Bay).

CURCULIONIDÆ

POLYPHRADES SATELLES, sp. nov.

Elongato-oblongus, subnitide niger; plus minus crebre (? exemplo recenti confertim) fusco-vix subaureo-squamosus; rostro minus abbreviato obscure 5-carinato; antennis robustis, scapo prothoracem fere attingenti apice vix dilatato, funiculi articulo 1° 2° duplo (hoc 3° vix) longiori; oculis sat magnis, sat transversis, infra acuminatis, subtiliter granulatis; prothorace quam longiori dimidia parte latiori, margine basali elevato instructo, sat crasse (parte antica angusta excepta) mamillato-ruguloso, basi quam margo anticus fere duplo latiori, lateribus sat rotundatis, latitudine majori pone medium posita; elytris prothorace haud multo latioribus, apice haud divaricatis, sat fortiter punctulato-striatis, interstitiis parum convexis vix mamillato-subgranulatis, sutura postice haud carinato. [Long. (rostr. incl.) $5\frac{2}{3}$ - $6\frac{4}{5}$, lat. $2\frac{1}{3}$ - $2\frac{4}{5}$ lines.

Maris elytrorum lateribus mox pone basin sat evidenter, feminae vix, sinuatis.

The general resemblance of this species is to *P. longicollis*, Pasc., from which the longer antennal scape hardly dilated at the apex will *inter alia* at once separate it. I have no doubt of my identification of *P. longicollis*, although that species is very imperfectly described,—no mention being made *e.g.* of the eyes, although in a memoir published little more than a year before the publication of *P. longicollis* Mr. Pascoe founded the primary divisions of the genus on the characters of the eyes. The combination of large size, eyes as described above, non-carinate suture of elytra and obscure squamosity will distinguish the insect from its previously named congeners.

W. Australia; Eyre's Sand Patch (Mr. Graham) and Israelite Bay (Mr. French).

ACANTHOLOPHUS NIVEOVITTATUS, sp. nov.

Anguste oblongus; niger; niveo-squamosus; squamis niveis rostrum (parte apicali nitida excepta) caput prothoracis latera corpus subtus pedesque sat dense (nihilominus maculis parvis numerosis interruptis) tegentibus et vittas insignes in corpore supra formantibus, sc.,—in prothorace medio, et in elytris singulis (hic ad suturam, a humero fere ad apicem, et irregulariter trifariam in parte laterali declivi); rostro utrinque supra antennarum basin spina longa valida, supra oculum spina trifida perlonga instructo; oculis sat angustis; antennarum articulo 2^a 1^a sat longiori; prothorace spinis acutis 4-seriatim instructis; elytris apice minute divaricatis, squamis brunneis (in partibus haud niveosquamosis) minus dense vestitis, singulis granulis (vel potius tuberculis parvis) nitidis sat dense (circiter 12-seriatim) instructis et fortiter trifariam tuberculis spiniformibus et spina acuta subapicali armatis (serie 1^a prope suturam tuberculis 6 a basi retrorsum gradatim majoribus, 2^a sinuata tuberculis 6 magnis, 3^a postice abbreviata tuberculis 3 magnis). [Long. 8, lat. 3½ lines.

The snowy white vitta down the middle of the prothorax includes a narrow shining black line; the prothoracic dorsal series of spines each contain five gradually decreasing in size from the front, the front one being bifid; on each side of the prothorax there is a long sharp spine scarcely in front of the middle and a somewhat smaller one considerably behind the middle, as well as 3 much smaller spines which are alternated with the two long ones. The front tubercle (or rather, spine) of the middle row on the elytra might almost as well be regarded as a member of the external row, and this would place the present species in Sir W. Macleay's "Section 2 B a" of the genus, as having a compound tubercle over the eye, and on each elytron three rows of spines (the outer row containing at least 4), and a subapical spine. From all the others

of that section,—and indeed of any section,—except *A. Franklinensis*, Blackb., the present species is at once distinguishable by the spine over the eye being trifid. From *A. Franklinensis* the different armature of its elytra and the 5 brilliant silvery white vittæ (the lateral 2 very close together and somewhat coalescing, the next before them defined sharply only in its posterior half, and only the sutural and the marginal ones quite reaching the apex) are *inter alia* good distinctions. The closely set shining tubercles on the elytra run in double rows which are well defined except among the rows of large spiniform tubercles where they become sinuous and here and there run into each other.

Yilgarn, W. Australia; sent to me by C. French, Esq.

DIALEPTOPUS VALIDUS, sp.nov.

Sat robustus; piceus, indumento cinereo tectus; rostro perbrevis transverso in medio late profunde sulcato; antennis crassis, scapo extrorsum fortiter incrassato, brevi (quam tarsorum anticorum articulus 4^{us} multo breviori), funiculi articulis 1° et 2° ceteris vix longioribus; prothorace apice bilobo, lateribus sat rotundatis; elytris prothorace paullo latioribus, tuberculis magnis extrorsum inclinatis (in elytro singulo 6, biserialiter positae) armatis, inter hæc dorso sat crebre granulis foveisque ruguloso, lateribus crassissime reticulato-foveolatis, latitudine trans processus humerales quam trans prothoracem haud minori.

[Maris (?) long. 6, lat. 2½ lines; feminae (?) long. 8, lat. 3½ lines. [The width is measured across opposite tubercles.]

The humeral processes of the elytra bulge out so much laterally that the width of the insect across them is quite equal to (in the male) or a little greater than (in the female) the greatest width across the prothorax; in all the previously named species known to me the width across these processes is much less than the greatest width of the prothorax. The elytral tubercles being only three in each row and being very little elevated upward, but

strongly directed outward, furnish another very distinctive character, and yet another consists in the very short antennal scape strongly and evenly thickened from its base to its apex. The elytral tubercles are a little more elevated in the smaller and narrower sex than in the other. In the former the apical ventral segment is deeply sulcate down the middle; in the latter the last segment bears a very large roundish fovea, with an elevated border except in front.

S. Australia; Fowler's Bay. Also from Israelite Bay, W. Australia (Mr. French).

DIALEPTOPUS LUGUBRIS, sp. nov.

Elongatus; niger, indumento sordide ochreo plus minus tectus; rostro transverso in medio late profunde sulcato; antennis minus crassis, scapo extrorsum minus incrassato minus brevi (quam tarsorum anticorum articulus 4^{us} vix breviori), funiculi articulis 1^o et 2^o ceteris parum longioribus; prothorace apice bilobo, lateribus sat rotundatis; elytris prothorace paullo latioribus, tuberculis conicis in seriebus 2 (interiore 3 vel 4, exterior 3 vel 4 vel 5, constitutis) armatis, inter hæc dorso granulis foveisque obscure ruguloso, lateribus crassissime seriatim foveolatis, latitudine trans processus humerales quam trans prothoracem haud minori.

[Mars (?) long. 6, lat. 2½ lines; femina (?) long. 8, lat. 3 lines. [The width is measured across opposite tubercles.]

Closely allied to the preceding but more elongate, of more sombre appearance, and with longer legs and tarsi; the scape of the antennæ is more slender and elongate, being of about the same length as the claw joint (exclusive of the claws) of the front tarsi (in *D. validus* much shorter than the same joint). The number of tubercles in the rows on the elytra is very variable even in an individual example (in one before me one elytron has 5 tubercles in the external and 4 in the inner row, while the other elytron has only 3 in each row); they are much more erect

than those of *D. validus*. I am much puzzled as to the sexes of these insects,—the smaller and narrower sex of this species has on the apical ventral segment a circular fovea very nitid inside and quite surrounded by a defined edging (quite different from,—but nevertheless *resembling* the sexual character of the larger and broader sex of *D. validus*) while the larger and broader sex of this species has the hinder part of the apical ventral segment widely sulcate,—the sulcation not quite reaching the apex (after the same plan as in the smaller and narrower sex of *D. validus*). This species may be distinguished from all previously described by the following combination of characters,—elytra wide across the humeral processes, scape of antennæ not abnormally short, tarsi normally slender, colour very sombre, antennal tubercles in inner row 3 or 4, no strongly prominent longitudinal costæ on the sides of the elytra, general surface not clothed with erect setæ.

S. Australia ; Fowler's Bay.

DIALEPTOPUS OBSOLETUS, sp.nov.

Sat elongatus ; niger, haud squamosus ; rostro haud transverso in medio late profunde sulcato ; antennis minus crassis, scapo extrorsum minus incrassato minus brevi (quam tarsorum anticorum articulus 4^{us} vix breviori), funiculi articulis 1° et 2° ceteris sat longioribus ; prothorace apice bilobo, lateribus sat rotundatis ; elytris prothorace paullo latioribus, tuberculis in seriebus 2 (interiore circiter 5 subobsoletis, exteriori 5 conicis, constitutis) armatis, inter hæc dorso sat crasse foveolato, lateribus crassissime seriatim foveolatis (interstitiis fortiter convexis), latitudine trans processus humerales quam trans prothoracem paullo minori. [Long. 7½, lat. 2¼ lines.

The sculpture of the elytra in this species is very peculiar and very difficult to describe intelligibly ; the external row of tubercles is of the usual kind, but the internal row consists of prominences which can hardly be called tubercles,—the appearance is somewhat as it would be if these had been tubercles which had been sliced off almost level with the general surface, so that looked down upon from above there is little to be seen of them, but viewed

from the side, owing to the lateral slope of the elytra, they appear as fairly defined tubercles. The whole surface of the elytra is seriately foveolate and the 2nd row of foveæ (from the suture) is placed so that a large fovea occupies the upper surface of each quasi-tubercle. The largest of these quasi-tubercles is the hindmost and they become gradually smaller forward and are continued quite to the apex of the humeral processes, until they are little more than large granules; if all these be counted in the row it consists of about 15 quasi-tubercles and granules. This peculiar sculpture distinguishes the present species from all previously described. The apical ventral segment is similar to that of the smaller and narrower sex of *D. lugubris*.

S. Australia; near Morgan.

DIALEPTOPUS LINDENSIS, sp. nov.

Sat elongatus; niger, vix squamosus; rostro vix transverso in medio late profunde sulcato, antennis sat crassis, scapo extrorsum minus incrassato minus brevi (quam tarsorum anticorum articulus 4^{us} baud breviori), funiculi articulis 1° et 2° ceteris paullo longioribus; prothorace apice bilobo, lateribus sat rotundatis, cristis dorsalibus subrectis; elytris prothorace paullo latioribus tuberculis plus minus rufescentibus in seriebus 2 (interiore 3 extrorsum inclinatis, exterior 3 vel 4, constitutis) armatis, inter hæc dorso vix perspicue sculpturato, lateribus crasse seriatim foveolatis (interstitiis latis sat convexis), latitudine trans processus humerales quam trans prothoracem sat minori. [Long. $5\frac{3}{4}$ -6, lat. $2-2\frac{2}{5}$ lines.

I have seen a good many examples of this insect, all of which have in the inner elytral series only three large somewhat compressed tubercles which are somewhat directed outward; this character will distinguish it from all its described congeners except *granulatus*, Pasc., and *validus*, Blackb.; the prothorax of the former of these is described as "haud cristatus," while the latter *inter alia* has the scape of the antennæ extremely short. In

hindwards more evenly and less strongly than is usual in the other species known to me, the more usual structure being that these crests diverge gently hindward for a little distance from the front and then take a curved form so that the lateral edges *converge* again towards the base. The difference of the sexes in general form is less than usual, the narrower sex having the apical ventral segment with a wide shallow longitudinal impression in its hinder half and the other sex having near the apex of the same segment a round excavation. This is a very dull black insect, with at most some inconspicuous greyish dust-like squamosity. The tarsi are slender and elongate in both sexes.

S. Australia; near Port Lincoln.

DIALEPTOPUS SEPIDIODES, Pasc.

I possess an example from Western Australia agreeing perfectly with the description and figure of this insect, and also an example from the same locality which I feel satisfied is the other sex of the same, though the differences that I believe to be sexual are very marked. The species is characterised by its greyish-brown general colour (due to squamosity on a blackish derm) ferruginous colour of tubercles, elytra very much narrower across the humeral processes than the greatest width of the prothorax, anterior projection of prothorax not bilobed, antennal scape very fully as long as apical joint of front tarsi (without the claws), basal two joints of funicle each evidently longer than any of the other joints, and elytra (together) with the apex widely (somewhat near semicircularly) emarginate. The sex described by Mr. Pascoe (the male, I suppose) is an exceptionally narrow form, with the elytra (the tubercles disregarded) not wider than the prothorax, the front tarsi much wider and shorter than the other tarsi, and the elytra with strong conical tubercles in two rows,—the inner one of 7 or 8 distinct tubercles (in my example 7 on one elytron, 8 on the other) the outer one of 5,—the last ventral segment reflexed at the apex immediately behind a strong transverse furrow and deeply sulcate down the middle, the metasternum and ventral segments strongly nitid.

The specimen which I take to be the female is a larger and very differently shaped insect, the elytra being oval and at the widest (slightly behind the middle) considerably (i.e. as 4 to 3) wider than the prothorax. The elytra are differently tuberculated, the inner row having all the tubercles of its front $\frac{2}{3}$ run together into a serrate ridge behind which are three separate elongate compressed tubercles, the outer row having only 4 tubercles which are blunter and more elongate than those of the other sex. All the tarsi are more elongate, the front ones being as slender as the rest. The last ventral segment bears a wide semilunar sulcus immediately behind the apex in front of which the surface is strongly gibbous in the middle, an obscure fine carina running backward from the gibbosity across the middle of the semilunar sulcus to the hind margin. It is most probable that the tuberculation of the elytra is variable, but I find it is almost invariably stronger (in the species of this genus) in the small narrow specimens (which I take to be males) than in the others; this is also the case in many other *Amycteridæ*.

Except in the characters mentioned above there is absolutely no difference between the two specimens discussed above. The legs in both the examples are a little ferruginous in colour.

SYMBOTHYNUS, gen. nov. (*Erirhinides*).

Corpus obscure squamosum, sat angustum sat elongatum subparallelum; rostrum elongatum gracile cylindricum leviter arcuatum, prothorace longius, ad apicem leviter dilatatum, supra lineis elevatis longitudinalibus obscure instructum, setulis erectis sparsis vestitum; scrobes præmedianæ postice infra conniventes; scapus oculum haud attingens; funiculus 7-articulatus, articulo 1° sat elongato, ceteris brevioribus; clava minus elongata; oculi sat depressi, subtiliter granulati; prothorax basi leviter bisinuatus, lobis ocularibus nullis; scutellum distinctum; elytra prothorace parum latiora; coxæ intermediæ sat approximatae; femora in medio sat incrassata, mutica; tibiæ anticae intus bisinuatæ, haud

denticulatæ, apice mucronatæ; tarsorum articulus ultimus sat exsertus; unguiculi divergentes; abdominis segmenta 3^{um} et 4^{um} conjuncta 2^o breviora; suturæ ventrales haud ad latera angulatæ, 1^a arcuata; prosternum antice sat elongatum sat fortiter emarginatum, haud canaliculatum.

The combination of connivent rostral scrobes with an antennal funicle not longer than the scape, having its 2nd joint much nearer in shape and size to the 3rd than to the 1st, will I think separate this genus from all previously described Australian *Erirhinides*. The scales are coarse and very flatly adpressed, so that they are little conspicuous, and have rather the appearance of patches of some extraneous indumentum.

SYMBOTHYNUS SQUALIDUS, sp. nov.

Elongatus, piceus, elytris umbrinis vel ferrugineo-umbrinis, antennis pedibusque obscure rufescentibus, abdomine postice rufo; subtus squamis albis dense, supra squamis obscuris et nonnullis albis, vestitus; setulis brevibus suberectis sparsim instructus; rostro prothorace paullo longiori; hoc parum transversum, crebre sat fortiter rugulose punctulato, lateribus sat rotundatis; elytris sat fortiter punctulato-striatis, interstitiis vix convexis; corpore subtus crebre sat fortiter subrugulose punctulato. [Long. 2, lat. $\frac{1}{2}$ line.

The derm on the undersurface in fresh specimens is almost completely concealed by scales; my description of its colour therefore is only of a single example which I have denuded, and this may be variable, but if not the red apical 3 ventral segments are a conspicuous character. On the upper surface the scales are of a kind of neutral tint, with the exception of a white line down the middle of the prothorax, a small white blotch on each shoulder, white scales on the scutellum, and a variable and irregular projection here and there of the white scales of the undersurface on the sides of the prothorax and elytra.

S. Australia.

AGESTRA.

The following species may, I think, be placed in this genus, as it does not differ more widely in its structure from the characters Mr. Pascoe attributes to the genus than does the second species placed in it by Mr. Pascoe himself. The following are the structural characters of the insect before me: rostrum somewhat stout and cylindric, scarcely arched and scarcely so long as the prothorax, its upper surface almost to the apex continuing the puncturation of the head, its scrobes median and very oblique; scape of antennæ scarcely attaining the lower part of the eye, funiculus 7-jointed, stout, its basal joint not much longer than wide, but very much larger than the 2nd; eyes slightly prominent, finely granulated; prothorax gently transverse, its base scarcely bisinuate, no ocular lobes; elytra oblong, much wider than the prothorax; intermediate coxæ scarcely further apart than in *Olanæa*; femora with a small tooth beneath; apical mucro of anterior tibiæ very feeble; claws widely divergent (but not divaricate), claw joint of normal length; 2nd ventral segment decidedly shorter than 3rd and 4th together; ventral sutures not angular laterally, the 1st gently arched in the middle. Body clothed with erect setæ.

AGESTRA PUNCTULATA, sp. nov.

Rufa, corpore subtus sutura et elytrorum lateribus obscurioribus, antennarum clava nigrescenti; supra setulis erectis pallidis vestita; rostro capite prothoraceque sat crebre punctulatis; elytris punctulato-striatis, interstitiis sat planis punctulatis; corpore subtus sat crebre subfortiter punctulato.

[Long. $1\frac{1}{2}$, lat. $\frac{3}{4}$ line (vix).

S. Australia; near Adelaide.

CYDMÆA LINEATA, sp. nov.

Breviter elliptica; picea; squamis (subtus et in pedibus griseo-subviridibus, supra aliis griseis aliis ochraceis aliis nigrescentibus) vestita; squamis griseis vel ochraceis in elytris angustis-

sime lineatim dispositis; rostro quam prothorax sesquilongiori; funiculi articulo 1° quam 2^{us} fere sesquilongiori; prothorace vix transverso, subtilius sat crebre punctulato; elytris striato-punctulatis, interstitiis sat planis uniseriatim punctulatis, puncturis in striis quam in interstitiis haud majoribus. [Long. $1\frac{2}{5}$, lat. $\frac{3}{8}$ line.

This appears to be quite a typical *Cydnaea* scarcely differing from *C. luctuosa*, Pasc., (with which I have carefully compared it) otherwise than by the greater length of the rostrum and the different colouring and pattern of its scales. These cover the whole surface so that in a fresh example the sculpture is entirely hidden. Taking the blackish scales as the ground, the brown (or in some examples whitish-brown) scales are the prevailing ones on the head and base of rostrum, are thickly sprinkled singly like minute pale specks on the prothorax, and on the elytra have a tendency to run (placed in single file) in longitudinal lines separated from each other by lines of dark scales also running in single file; these pale lines of scales are much interrupted but in many places three or four adjacent lines are interrupted at the same distance from the base of the elytra, and the next three or four at a different point so that from some points of view there is an appearance of a number of spots each consisting of three or four lines of differently coloured scales, equal in length and placed side by side,—but a merely casual glance gives the idea of a blackish surface confusedly and not very conspicuously mottled with pale brown.

C. lineata is closely allied to *C. obscura*, Blackb., from which it differs by its evidently longer rostrum and less transverse prothorax, the latter being decidedly more rounded laterally and less narrowed in front as compared with the base;—the scale-markings moreover are different, the lighter scales in *obscura* being comparatively much more prevalent in the apical portion of the elytra and there being distinctly *white*, whereas in *lineata* they are somewhat evenly distributed and in no part are really white.

Kangaroo Island; taken by Mr. J. O. Tepper.

DICOMADA.

In characterising this genus Mr. Pascoe does not describe the claws nor the relative length of the ventral segments. In the specimens before me which appear to belong to it the claws are divaricate, the 2nd ventral segment is slightly longer than the next two together, and the 1st ventral suture is arched; the basal 2 ventral segments are together much longer than the other 3 together, the 2nd scarcely longer than the apical one (measurements down the middle line).

DICOMADA LITIGIOSA, Pasc.

I have specimens from Western Australia which appear to be this species; they fit the description satisfactorily in all respects except the sculpture of the rostrum. Mr. Pascoe says that the rostrum is "basi subtiliter lineatum punctulatum." I think "basi subtiliter punctulato-striatum" would apply better to the rostrum of the example before me, but the discrepancy is hardly sufficient to suggest specific distinction,—it may be a mere matter of words. The basal half of the rostrum is finely striated longitudinally and each stria contains a row of punctures,—the interstices appearing as excessively fine carinae; in some examples the striae are very distinct and punctured throughout while in others (taken in company with them) the striae are scarcely marked and punctured only in their basal half.

DICOMADA RUFA, sp. nov.

Rufa; rostro (parte apicali excepta), capite, prothoraceque plus minus picescentibus vel subnigris; argenteo-squamosa; squamis (his hic illic subcupreo-micantibus) subtilis dense æqualiter, supra minus confertim in elytris obscure subbifasciatim, dispositis; antennarum funiculi articulo 1° 2° paullo longiori; rostro prothorace sesquilongiori basi subtiliter 5-carinato; elytris punctulato-striatis, puncturis magnis, interstitiis sat planis uniseriatim punctulatis. {Long. $1\frac{1}{2}$ (vix), lat. $\frac{7}{10}$ line.

This species appears to agree quite satisfactorily in structural characters with *Dicomada* as described by Mr. Pascoe,—nor can I find it to differ in any structural character from the specimens mentioned above as *D. litigiosa*. The scales on the upper surface do not form any well defined pattern ; those on the prothorax are silvery about the sides of the segment and tend more to a coppery tone on the disc ; on the elytra the silvery scales form a wide fascia at the base and another behind the middle which in some examples are fairly well defined while in others all that can be said is that on a somewhat wide transverse space just in front of the middle the silvery scales are less plentiful than elsewhere ; where the fasciæ are at all well defined the hinder margin of the basal fascia and the front margin of the hinder one are shaped a little like a very widely open V.

Differs from *D. litigiosa*, Pasc., and *D. murina*, Pasc., *inter alia* by the rostrum being blackish at the base with more or less of the apex red, and from the other two previously described species *inter alia* by the greater length of the rostrum.

S. Australia ; Port Lincoln, near Adelaide, &c.

ANTYLLIS.

The following species differs in many characters and in general appearance somewhat widely from *A. alternata*, Blackb., but as up to the present time I believe only this one genus of Australian *Erirhinidæ* has been described with the following characters ;—funicle of antennæ 6-jointed, femora unarmed, apical joint of tarsi projecting well beyond 3rd joint,—I think it will be well to attribute to it all species combining those characters.

ANTYLLIS BELLA, sp.nov.

Breviter ovalis ; picea, pedibus ferrugineis ; omnino squamis sat crassis subsericeis dense vestita ; subtus et in pedibus squamis sat nitidis argenteo-subviridescentibus ; supra squamis pallide brunneis, his in rostri et capitis lateribus, in prothorace trivittatim, et in elytris circa scutellum vittatimque latera versus (vittis postice intus dilatatis) cum squamis albidis

intermixtis; corpore supra setulis crassis nigris suberectis sat sparsim instructo; rostro prothorace vix longiori, subulato; scrobes præmedianæ obliquæ infra oculos desinentibus; antennis sat validis, scapo ad oculum attingenti sat elongato; funiculi articulo 1° sat brevi quam 2^{us} paullo longiori, ceteris brevibus; clava ovata distincta; oculis subconvexis sat tenuiter granulatis; prothorace ruguloso, quam longiori vix latiori, antice sat angustato, basi rotundato, lateribus leviter rotundatis; elytris striato-punctulatis, striis leviter impressis, puncturis sat magnis, interstitiis planis confertim subtiliter punctulatis; pedibus longiusculis; tibiis flexuosis, anticis apice breviter mucronatis; tarsis elongatis, unguiculis divergentibus; segmentis ventralibus 1° 2° que conjunctis quam cetera conjuncta longioribus, 3° quam 3^{us} 4^{us} que conjuncta vix longiori; prosterno ante coxas anticas brevi, coxis intermediis approximatis. [Long. 1½, lat. ⅙ lines.

This species may perhaps be near *A. togata*, Pasc., of which the description is very brief, but as the rostrum of that species is not said to be subulate while that of another species in the genus is so characterised, and the prothorax is said to be "sat confertim punctato" it would not appear to be identical. *A. togata* moreover is said to be rufo-castaneous in colour.

S. A. near Gawler.

OLANÆA.

The following species will not quite fit into any named Australian genus of *Eriirhinidæ* but it appears so rare an occurrence to find two species quite identical structurally that it seems better not to insist on absolute structural identity than to create such a host of new genera as otherwise would be required. The following species agrees with the examples from Albany which I mentioned in a former paper as apparently identical with *O. nigricollis*, Pasc., in the following characters,—scrobes præmedian, oblique, passing to the underside of the rostrum and terminating beneath the eye; scape of antennæ reaching back far enough to touch the eye; funicle 7-jointed; eyes finely granulated and rather small,

prothorax without ocular lobes, rounded at the base; elytra oblong, much wider than the prothorax; femora unarmed; tibiæ flexuous, feebly mucronate at the apex; tarsi elongate (quite $\frac{2}{3}$ of the length of their tibiæ), joints 1-3 gradually wider, 3rd wide and strongly bilobed, 4th elongate, claws rather large, divergent; intermediate coxæ approximate; intermediate ventral segments produced hindward at the sides; prosternum very short in front of front coxæ; body setulose. This insect differs from the species mentioned as follows; the rostrum is not subulate; the ventral segments are differently proportioned, the 1st and 2nd together being scarcely so long as the apical three together, the 2nd being shorter than the 5th (which is exceptionally long) and also than the 3rd and 4th together; the hind coxæ are not quite so widely separated; and the rostrum is markedly longer.

In Mr. Pascoe's tabulation of *Eriirhinid* genera the comparative shortness of its 2nd ventral segment would suggest a doubt whether this species ought to fall beside *Storeus* (in which case its prosternum not at all sulcate would distinguish it) or with the following group of "*Storeides*" (*Hedyopsis*, &c). Among these genera the tabulation would assign it to *Olanæa* without any doubt. From the genera of "*Storeides*" described since the publication of Mr. Pascoe's tabulation the present insect may be at once distinguished by the combination of unarmed femora, antennæ inserted not near the base of the rostrum, and approximate intermediate coxæ. [One of these last, *Phæodica*, seems to be scarcely distinct from *Olanæa*, however. Judged by Mr. Pascoe's description it only differs in having obsolete ocular lobes in place of none, the intermediate coxæ a little less approximate, and the upper surface scaly but not setose.]

OLANÆA MACULATA, sp. nov.

Oblonga; ferruginea; subtus squamis albis vestita; supra ferrugineo-squamosa, inter squamas ferrugineas nonnullis albis (his in prothorace 3-vittatim, in elytris basi 5-vittatim et latera versus magis diperse dispositis) et nigro-fuscis (his in elytrorum singulorum disco vittas 2 breves formantibus) intermixtis;

supra setis suberectis vestita, setis cum squamis inter quas nascuntur concoloribus; rostro prothorace nullo modo breviori, postice ad latera longitudinaliter carinato, cylindrico, sat valido; prothorace vix transverso sat rugulose punctulato, antice leviter angustato, lateribus leviter rotundatis; elytrorum sculptura sub squamositate abdita; antennis sat validis, funiculi articulo 1° quam 2^{na} sesquolongiori (ambobus minus elongatis) ceteris sat brevibus, clava robusta elongata.

[Long. 1½, lat. ¾ line.

A. very pretty species with an intermixture of several colours,—ferruginous, white and blackish,—both in scales and semi-erect setae. The pattern is complicated and not very conspicuous except that the short vittae,—or longitudinal splashes,—of blackish on the disc of the elytra catch the eye at once. Of these the one nearer to the suture on either side is a little further from the base than the other, so that the four form something like a V. As I have seen only a single specimen it is possible that the arrangement of colours may vary, but I should expect to find the blackish vittae constant.

S. Australia; near Adelaide.

MERIPHUS RAUCUS, sp. nov.

♂. Piceo-niger, antennis (apice excepto) et nonnullis exemplis rostro in medio ferrugineis; squamis pallidis setiformibus (subtus æqualiter sat dense, supra obscurius maculatim) vestitus; rostro prothorace fere sesquolongiori; antennis sat longe ante rostri medium insertis, scapo oculum attingenti, funiculi articulo 2° 1° sesquolongiori; prothorace vix transverso, antice fortiter abrupte tubulato, lateribus pone partem tubulatam leviter arcuatis, disco (utrinque tuberculis minutis setiferis instructo) vix perspicue punctulato in medio haud carinato, elytris obscure striatis, interstitiis alternis sat fortiter elevatis et tuberculis minutis setiferis uniseriatim instructis. [Long. 3, lat. 1½ lines (vix).

♀. Rufescens; capite, antennis apicem versus, rostri et tarsorum apice ipso, corporeque subtus (abdomine excepto),

obscurioribus ; rostro prothorace duplo longiori, antennis vix ante rostri medium insertis ; scapo oculum vix attingenti.

[Long. $3\frac{1}{2}$, lat. $1\frac{1}{2}$ lines.

The pallid scales (which are more ferruginous in the female than in the male) occupy the sides of the prothorax, and are condensed in a series of spots down each of the non-elevated interstices, which are wider than the alternate ones. The small setiferous tubercles run in a close row down each of the elevated interstices and there are also a few (somewhat larger) on the non-elevated interstices. The tubercles on the prothorax are less nitid (especially in the male) than those on the elytra. I have seen five males and two females of this species, and the difference of colour seems to be constant. The tubercles on the prothorax seem to distinguish this species from all previously described *Meriphi* except *longirostris*, Pasc., in which the rostrum is said to be three times as long as the prothorax.

S. Australia ; on *Casuarina* near Port Lincoln.

MERIPHUS LINEATUS, sp. nov.

Piceo-ferrugineus, antennis capite prothoraceque obscurioribus ; squamis albidis sparsim vestitus ; his in elytris lineatim dispositis ; rostro prothorace fere duplo longiori ; antennis sat longe ante medium rostri insertis, scapo oculum haud attingenti, funiculi articulis basalibus 2 subæqualibus ; prothorace haud transverso, antice tubulato, medio carinato, lateribus pone partem tubulatam leviter arcuatis, disco obscure rugulose punctulato ; elytris punctulato-striatis, rugulosis, vix perspicue granulatis, interstitiis alternis elevatis.

[Long. $2\frac{1}{2}$, lat. $\frac{1}{2}$ line.

I have seen five examples of this species, among which I do not observe any noticeable sexual differences. The absence of distinct granulation, together with the evident prominence of the alternate interstices of the elytra, down each of which runs a somewhat conspicuous stripe of whitish scales, will distinguish the present insect from its described congeners.

S. Australia ; Nuriootpa, &c.

GLAUCOPELA VARIPES, sp. nov.

Piceo-nigra, squamis vestita, his subtus (et in pedibus) albido-vel viridi-opalescentibus dense confertis, supra griseis sat æqualiter minus confertim positis; rostro (basi excepta) antennis pedibusque (femoribus exceptis) læte rufis; rostro sat lato prothoraci longitudine æquali; prothorace quam longiori fere duplo latiori, antice fortiter angustato; elytris punctulato-striatis, interstitiis sat latis vix convexis.

[Long. $1\frac{1}{2}$, lat. $\frac{3}{8}$ line.

The bright red rostrum, antennæ, tibiae and tarsi (in strong contrast to the rest of the body) render this little species a very distinct one.

S. Australia; widely distributed; I have it from the Lake Eyre Basin and also from the Adelaide district.

ANARCIARTHURUM VIRIDE, Blackb.

When describing this species (P.L.S.N.S.W., 1890, p. 355) I accidentally omitted the mention of its habitat, which is Port Lincoln, S. Australia.

DESCRIPTION OF A NEW GENUS OF CYSTIGNATHOID
FROGS FROM NEW SOUTH WALES.

By G. A. BOULENGER.

(Communicated by J. J. Fletcher).

PHANEROTIS.

Pupil horizontal. Tongue oval, entire and free behind. Vomerine teeth in long transverse series behind the choanæ. Tympanum perfectly distinct. Fingers free, toes with a very slight rudiment of web, the tips not dilated. Outer metatarsals bound together. Omosternum very small, cartilaginous; sternum a cartilaginous plate. Diapophyses of sacral vertebra slightly dilated. Terminal phalanges simple.

This new genus comes nearest to *Cryptotis*, Gthr., with which it agrees in the horizontal pupil, the shape and attachment of the tongue, the structure of the pectoral arch, and the dilated transverse processes of the sacrum; but it differs in the distinct ear, and the arrangement of the vomerine teeth, by which latter character it approaches *Limnodynastes*. The relations of the Australian genera of the family *Cystignathidæ* are shown in the following table:—

	Pupil.	Tympanum.	Toes.	Vomerine teeth.	Outer metatarsals.	Sacral diapophysis.
<i>ixophyes</i> , Gthr.	Vertical	Distinct	Webbed	Long series behind choanæ	Separated by web	Cylindrical
<i>imnodynastes</i> , Gthr.	Do.	Not or but slightly distinct	Free, or nearly so	Do.	Bound together	Do.
<i>hanerotis</i> , Blgr.	Horizontal	Distinct	Do.	Do.	Do.	Flattened
<i>ryptotis</i> , Gthr.	Do.	Hidden	Do.	Small groups behind choanæ	Do.	Do.
<i>rinia</i> , Tech.	Do.	Not or but slightly distinct	Do.	Do., or absent	Do.	Do.
<i>yperotia</i> , Gray.	Vertical	Hidden	Do.	Absent	Do.	Do.
<i>hiroleptes</i> , Gthr.	Do.	More or less distinct	Webbed	Between choanæ	Do.	Do.
<i>elioporus</i> , Gray.	Do.	Hidden	Do.	Do.	Do.	Do.

PHANEROTIS FLETCHERI.

Habit Ranoid. Head as long as broad; snout obtuse, with sharp canthus and oblique, slightly concave loreal region; nostril a little nearer the end of the snout than to the eye; interorbital space as broad as the upper eyelid; tympanum three-fourths the diameter of the eye. Fingers and toes with strong subarticular tubercles and slightly swollen tips; first and second fingers equal; a small, blunt, inner metatarsal tubercle. The tibio-tarsal articulation reaches the tip of the snout; tibia four-fifths the length of the fore limb, as long as the vertebral column; foot a little shorter than tibia. Upper parts finely granulate, lower parts smooth; upper eyelids warty, a small A-shaped glandular fold between the shoulders, and an oblique fold from the eye to the middle of the side, passing above the tympanum. Pale brown above, with very small darker spots; a feebly marked lighter line along the middle of the body; sides of head, axillary region, and hinder side of thighs blackish-brown; a black band borders the postocular fold inferiorly, its lower border sinuous and involving the upper third of the tympanum; a few rosy spots below the eye and behind the axilla; a cross-bar between the eyes and the interscapular chevron-fold blackish; limbs with dark cross-bands; tarsus and outer toe bordered with black; lower parts whitish, with the exception of the tibia, which is brown.

From snout to vent 33 millim.

Hab.—Dunoon, Richmond River (collected by Mr. R. Helms.)

I am indebted to the kindness of Mr. J. J. Fletcher for a specimen of this interesting novelty, and for the opportunity of describing it.

DIPTERA OF AUSTRALIA.

BY FREDERICK A. A. SKUSE.

NEMATOCERA.—SUPPLEMENT II.

(Plate XIX.)

The present contribution includes descriptions of additional species belonging to the families Mycetophilidæ, Simulidæ and Bibionidæ. Mycetophilidæ:—(*Lygistorrhina*, gen. nov., 1; *Heteropterna*, Sk., 1; *Platyura*, Meig., 3; *Sciophila*, Meig., 5; *Neoempheria*, O.-Sack., 1; *Stenophragma*, gen. nov. (syn. *Homaspis*, Sk., præoc.), 3; *Acrodicrania*, Sk., 1; *Clastobasis*, gen. nov., 1; *Sceptonia*, Winn., 1; *Mycetophila*, Meig., 1; *Delopsis*, gen. nov. 1; *Dynatosoma*, Winn., 1; *Brachydicrania*, Sk., 1; and *Synplasta*, gen. nov., 1). Simulidæ:—(*Simulium*, Lat., 1). Bibionidæ:—(*Plecia*, Wied., 1; *Dilophus*, Meig., 3; and *Scatopse*, Geoff., 1). *Neoempheria*, *Sceptonia* and *Dynatosoma* are recorded for the first time from Australia. Among the Bibionidæ it will be noticed that *Plecia melanaspis*, Wied., *Plecia fulvicollis*, Fabr., both originally described from Java, and *Scatopse notata*, Linn., a well-known European species, are found to inhabit Australia. Altogether, five genera and twenty-six species are proposed as new.

It is here necessary to direct special attention to the rectification of an erroneous interpretation of the alar-venation in the Mycetophilidæ, as exemplified in my former paper on this family (P.L.S. N.S.W., (2), III., pp. 1124-1222, pls. 31-32, 1888); more particularly as I have there promulgated the error not only in my descriptions but in an attempt to translate Winnertz's system of classification of groups and genera (V. z.-b. G. Wien, XIII., pp. 656-665, 1865), with the substitution of Loew's terminology (Mon. Dipt. N. Amer., I., pp. xv-xxiv., 162). The same mistake

is also committed in my paper on the Bibionidæ (l.c., pp. 1363-1386, pl. 39). The blunder arose from the fact that the second longitudinal vein is wanting in the wings of the Mycetophilidæ and Bibionidæ, whereas it was considered to be present by me. What is apparently the second longitudinal vein is in reality the homologue of the third longitudinal vein in other families. Consequently all the succeeding veins and cells in the wings likewise received incorrect names.

Baron Osten-Sacken has favoured me with the following notes on the terminology of the venation:—

"It is a sore subject in Dipterology; it is not worked up yet as it ought to be. Schiner, in one of his papers, reproached Loew for having worked twenty-five years on Diptera without settling the terminology of the venation. Loew did it for the first time in *Mon. N. Amer. Dipt.*, I., (1862), when he was called upon to write a general introduction to Dipterology. This essay is obscure and unsatisfactory. On p. xvii. for example ("In most Diptera," etc.), Loew should have quoted instances of the structures he describes. On p. xxiv. he should have repeated in figs. 2 and 3 the lettering of fig. 1, in order to show the correspondence of the veins and cells in the three different wings. Why did he not do it? The answer will result I think of what follows:

"It was Schiner, a couple of years later (*Verh. Zool. Bot. Ges. Wien*, XIV., p. 193-211, 1864), who laid the foundation of a theory of the venation. He showed that Orthorhapha and Cyclorhapha have their respective venations built on a different plan. In the Orthorhapha the discal cell is formed by the forking of the fourth vein (Schiner's Discoidal-ader); in the Cyclorhapha the fourth vein does not fork; the so-called discal cell is formed by the fourth and fifth vein (Postical-ader of Schiner); compare l. c., p. 207, "Betrachtet Man die Eigenthümlichkeit," etc. In other words, the discal cell of the Orthorhapha is not homologous with the so-called discal cell of the Cyclorhapha; and the so-called posterior transverse vein of the Orthorhapha is not homologous with the posterior transverse vein of the Cyclorhapha. Loew did not

know that when he wrote his paper on the terminology, and hence its insufficiency, which he must have felt after he had written it. But Schiner also did not carry out his theory very thoroughly; in some points it seems to me that he is in contradiction with himself.

"In the meantime, for ordinary descriptive purposes, we have a nomenclature which is conventional, but nevertheless useful, because it contains as little innovation as possible. In most wings of the Diptera the small or anterior cross-vein is an easily discernible object; it is always placed between the third and fourth veins. We call discal cell the well-known cell in the middle of the wing, although, as I said before, the discal cell of the Orthorhapha is not homologous with that of the Cyclorhapha. We call first posterior cell, the cell which has the small cross-vein at its basis. All the rest is, in most cases, easily found. But not always,—the interpretation of some venations is very difficult.

"I can understand, for instance, that you found some difficulty in translating Winnertz's terms into those of Loew. Loew (l.c.) gives no hint whatever about the Mycetophilidæ. But in Schiner (V. z.-b. G. Wien, p. 200, tab. 3, fig. 1) we find a figure of a wing of *Mycetophila*, with the nomenclature of the venation. The longitudinal veins are:—Mediastinal-ader (Loew's auxiliary vein); subcostal-ader (Loew's first longitudinal vein); cubital-ader (Loew's third longitudinal vein); then follow the small cross-vein and the fourth longitudinal vein. The second longitudinal vein is wanting, and this a peculiarity of the Mycetophilidæ.*

"In order to verify whether Loew had adopted for the Mycetophilidæ the same interpretation of the venation as Schiner (that is, whether he likewise omitted the second vein) I have examined his descriptions of Mycetophilidæ in Century IX. (Berl. Ent. Zeits., 1869), and in the Beschr. Europ. Dipteren. I find that, like Schiner, he always took for the third vein (Schiner's cubital),

* "This occasional absence of one or the other of the longitudinal veins induced Schiner to give them names (Mediastinal, Cubital, etc.), instead of merely numbering them (first, second, etc.). But the latter method has the advantage of priority, having been adopted by Meigen and developed by Loew."—Osten-Sacken, *in litt.*, 16th March, 1889.

the vein which in *Platyura*, *Macrocera*, etc., has the little branch at the end (an instance to the contrary in Besch. Eur. Dipt., I., p. 16, in the description of *Macrocera fastuosa* must be a *lapsus*). The two veins forming the large forks (*klmn* and *apqr* of your Pl. 32, fig. 17*) Loew would call the fourth and fifth veins (and Schiner would use the equivalent terms of Discoidal-ader and Postical-ader). Compare for instance Loew, Century IX., p. 139, No. 18, *Sciophila obtruncata*, "primum venæ longitudinalis quartæ segmentum a primo quintæ segmento longitudine paulo superatur."

"Therefore in your paper on Mycetophilidæ wherever you say *second* longitudinal vein, it should read *third*; and wherever you have *third* it should be *fourth* and so on, to the end. The names of the cells should also be changed. The *first posterior cell* is always the cell which has the small cross-vein at the base, therefore your cell F. Your G is the second posterior. C is the anterior, H the posterior basal cell; the latter here reaches the margin of the wing.

"In the Mycetophilidæ you hit upon one of the most difficult cases, because even Schiner's figure explains the matter incompletely. He has no name for your cell I (within the fork *pqr*). In reality it is the fourth posterior cell; but as there is no third posterior cell in this case (owing to the extent of H, the posterior basal cell) it may perhaps be more expedient not to name this cell, but, in case of necessity, to describe it as *the cell included within the fork of the fifth longitudinal vein*. Schiner may have meant it so in omitting to name this cell."

Fam. MYCETOPHILIDÆ.

LYGISTORRHINA, gen.nov.

Head small, rounded, narrower than the thorax; exserted from the thorax; front rather narrow. Eyes large, approximate beneath. Ocelli three, arranged in a small triangle on the vertex, the anterior one very small. Proboscis very long and slender, rather more

* P. L. S. N. S. W., (Ser. 2., Vol. III., 1888)

than half the length of the entire body (Pl. xix., fig. 2, head, antennæ, and proboscis with parts displayed.*) Palpi (apparently) wanting. Antennæ porrected, cylindrical, short, 2- + 14-jointed; flagellar joints longer than broad, progressively diminishing in thickness, with a microscopic pubescence. Thorax short, ovate, very gibbose; scutellum small; metanotum large, acclivous. Abdomen slender, somewhat compressed from the sides, narrowed at the base and extremity, seven-segmented; terminal lamellæ of the ovipositor elongate-elliptical. Legs long and slender; coxæ somewhat elongate, as in *Sciara*; fore and intermediate femora slender, the hind pair dilated, a little longer than the other pairs; fore and intermediate tibiæ and tarsi very slender; hind tibiæ incrassated towards the apex, nearly twice the length of the fore pair; hind tarsi thicker than those of the other legs. Fore tibiæ with one, intermediate with two very small spurs; hind pair with two unequal spurs; no lateral spines. Wings shorter than the abdomen, moderately broad, rounded off at the base, incumbent in repose; microscopically pubescent. Costal vein extending much beyond the tip of the third longitudinal vein, but not reaching the apex of the wing; auxiliary vein incomplete, very short, close to the first longitudinal; first longitudinal vein short, reaching the costa considerably before the middle of the wing; second longitudinal wanting, possibly represented by a pale vein-like incrassation between the first longitudinal vein and the base of the third longitudinal; no cross-vein between the longitudinal veins; third longitudinal vein originating at the base of the wing, tolerably straight, terminating in the costa opposite the tip of the posterior branch of the fork of the fourth longitudinal vein; fourth longitudinal incomplete, the petiole and base of fork wanting; fork of fifth longitudinal vein small, the anterior branch detached at the base; sixth longitudinal vein very rudimentary.

Obs.—The insect for which this genus is proposed reminds one more of the *Sciaridæ* than of the *Mycetophilidæ*, especially in the

* The proboscis was originally filiform and somewhat bent in the dried specimen before me; its component parts were displayed as figured on the application of moisture.

situation of the head, size of the coxæ, and length of the first longitudinal vein; while the character of the proboscis and the venation of the wings afford characters very distinctive from any hitherto described genus in either family.

463. *LYGISTORRHINA INSIGNIS*, sp.n. (Pl. xix., fig. 1.)

♀.—Length of antennæ.....	0·33 inch	...	0·84 millimètre.
Expanse of wings.....	0·095 × 0·037	...	2·39 × 0·90
Size of body.....	0·130 × 0·017	...	3·30 × 0·42

Head and antennæ black; the latter densely covered with a microscopic pubescence. Proboscis rather more than half the length of entire body, sordid ochreous, growing dusky towards the tip. Thorax deep brown, opaque, covered with very short black hairs; pleuræ somewhat shining. Halteres yellow. Abdomen black, somewhat shining, clothed with short black hairs, the third, fourth and fifth segments bordered anteriorly with ochraceous; terminal lamellæ yellow. Legs with a dense microscopic pubescence. Coxæ deep brown, the anterior pair sordid ochreous. Femora ochreous; the hind pair broadly flattened, longer than the others, with almost the apical half deep brown or black. Tibiæ sordid ochreous; the hind pair almost twice the length of the anterior pair, gradually thickened towards the apex, deep brown or black at the apex. Tarsi black; the metatarsus in the hind-legs nearly the length of the remaining joints taken together. Wings hyaline, with a pale greyish cloud above the fork of the fifth longitudinal vein, and the apex infuscated with greyish; brilliantly iridescent; veins deep brown. Venation as described in the generic diagnosis.

Hab.—Dunoon, Richmond River, N.S.W. (Helms). A single specimen in March.

Sub-section V.—*CEROPLATINÆ*.

Genus *CEROPLATUS*, Bosc.

Ceroplatus, Bosc, Proc. Linn. Soc. N.S.W. (2), III., p. 1163, 1888.

141. CEROPLATUS MASTERSI, Sk.

C. Mastersi, Sk., l.c., p. 1164, pl. xxxi., fig. 3.

Very numerous on windows in Sydney during March, April, and May. A few specimens have been taken in August. This insect also occurs in Queensland (F. Allbon), in March; *specimens in Coll. Queensland Museum*. I have recently bred this species from luminous larvæ inhabiting damp rotten wood obtained by Mr. J. J. Fletcher at Blue Mountains, N.S.W.

Genus HETEROPTERNA, Sk.

Heteropterna, Sk., l.c., p. 1166, pl. xxxi., figs 4-4e.

464. HETEROPTERNA AFFINIS, sp.n.

♂.—Length of antennæ.....	0·042 inch	...	1·06 millimètres.
Expanse of wings.....	0·145 × 0·060	...	3·66 × 1·54
Size of body.....	0·240 × 0·040	...	6·09 × 1·01

Remarkably like *H. Macleayi*, Sk., in size and colouring; the differences are as follows:—Antennæ rather shorter, sooty-brown. Palpi and hypostoma reddish-fulvous. Thorax with two convergent ochraceous lines from the humeral spots, meeting just before scutellum; pleuræ deep brown or black with very little ochraceous. Hind femora only slightly brown at the tip. In the fore-legs the tarsi rather more than twice the length of the tibiæ; in the hind-legs the tarsi a little longer than the tibiæ; the metatarsal joint about the length of and not thicker than the tibiæ in the fore-legs.

Hab.—Dunoon, Richmond River, N.S.W. (Helms). Two specimens in March.

Obs.—Very closely related to *H. Macleayi*, Sk., but readily distinguished by the form of the hind-legs, the lines on the thorax, and the colour of the antennæ. I cannot see any difference in the wings, or in the colour of the abdomen (which is deep brown or black, with the third to fifth segments bordered anteriorly with ochraceous in both species).

Genus PLATYURA, Meigen.

Platyura, Meig., l.c., p. 1169, pl. xxxi., figs. 5-6.b. *Sixth longitudinal vein not reaching the posterior margin.*

465. PLATYURA CONTINGENS, sp.n.

♀.—Length of antennæ..... 0·037 inch ... 0·90 millimètre.

Expanse of wings..... 0·160 × 0·055 ... 4·06 × 1·39

Size of body..... 0·170 × 0·032 .. 4·31 × 0·80

Antennæ shorter than the thorax; entirely dark brown or black, covered with a minute pale pubescence. Hypostoma and proboscis brown. Front black or sooty-brown. Palpi yellow. Thorax cinereous, opaque, densely covered with short black hairs; lateral and hind margins setiferous; humeri slightly tipped with yellowish-brown; pleuræ and metathorax dark brown, with a hoary bloom; scutellum yellowish-brown, setiferous. Halteres yellowish-brown, the stem pale ochreous. Abdomen dark brown, the second to last segment sordid yellowish-brown anteriorly; densely clothed with black hairs. Fore and intermediate coxæ pale ochreous, the latter with a longitudinal brown marking on the apical half in front; hind coxæ dark brown; all with short black hairs, more numerous on the fore pair; femora pale ochreous, the intermediate pair somewhat tinged with brownish at the base, densely covered with short black hairs; tibiæ darker than the femora; tarsi almost black, on account of their dense pubescence. Tibial spurs black. In the fore-legs the tibiæ about $\frac{2}{3}$ longer than the metatarsal joint. Wings somewhat shorter than the body, pellucid, almost hyaline, distinctly infuscated (more especially anteriorly) at the apex; veins deep brown. Costal vein extending beyond tip of third longitudinal vein one-third the distance from that to the tip of the anterior branch of the fourth longitudinal vein; anterior branch of the third longitudinal vein at an angle of 45° , its base situated at a point about $\frac{1}{4}$ the distance from tip of first longitudinal vein to tip of third longitudinal, auxiliary

vein joining the costa opposite the inner end of the marginal cell ; petiole and base of fork less distinct than the rest of the fork ; posterior branch of the fourth and anterior branch of the fork of the fifth longitudinal vein not reaching the margin.

Hab.—Sydney (Skuse). October.

Obs.—Most similar to *P. conformis*, Sk., from which it may be distinguished by the colour of the thorax and intermediate and hind coxæ, distinctly infuscated apex of wings, position of the anterior branch of third vein, and the incomplete sixth longitudinal.

466. *PLATYURA GRACILIS*, sp.n.

♂.—Length of antennæ.. ... 0·065 inch ... 1·66 millimètres.
 Expanse of wings 0·120 × 0·042 ... 3·04 × 1·06
 Size of body..... .. 0·140 × 0·020 ... 3·55 × 0·50

Antennæ longer than the thorax, slender ; joints of scapus sordid ochreous ; flagellar joints 2-4 times as long as wide, the terminal joint considerably longer than the penultimate ; dusky brown or blackish, the pubescence hoary. Hypostoma, proboscis and palpi brown or yellowish-brown. Front and vertex black or sooty-brown. Thorax sordid yellowish-brown, ochreous at the humeri, sub-levigate, with three longitudinal, slightly convergent, rows of black hairs, the lateral rows double anteriorly ; lateral borders and scutellum setiferous. Halteres brown, the stem sordid ochreous, pubescent. Abdomen yellowish-brown or brownish-ochreous, the segments bordered posteriorly with sooty-brown or blackish ; densely clothed with black hairs ; ♂ holding forceps sooty-brownish or blackish. Coxæ and femora ochreous-yellow ; the former with black hairs in front ; tibiæ cinereous ; tarsi black. Tibial spurs black. In the fore-legs the tibiæ somewhat longer than the metatarsal joint. Wings rather shorter than the body, pellucid, almost hyaline ; the costal and first two longitudinal veins black or deep brown. Costal vein extending beyond the tip of the third longitudinal vein slightly more than three-fourths the distance from that to the tip of the anterior branch of the fork of the fourth longitudinal vein ; auxiliary vein reaching the costa

opposite or slightly beyond the inner end of the marginal cell; anterior branch of the third longitudinal at an angle of about 45° , its base situated about mid-way between the tips of the first and third longitudinal veins; fork of the fourth longitudinal vein $2\frac{1}{2}$ times the length of the petiole, the latter in direct line with the posterior branch; sixth longitudinal vein very short and indistinct.

Hab.—Hogan's Brush, Narara Creek, near Gosford, N.S.W. (Skuse). August.

Obs.—Perhaps most nearly allied to *P. monticola*, Sk. It however differs greatly in the venation of the wings; and the antennæ are a little longer.

467. *PLATTURA RICHMONDENSIS*, sp.n.

♂.—Length of antennæ.....	0.042 inch	...	1.06 millimètres.
Expanse of wings.....	0.125×0.042	...	3.16×1.06
Size of body.....	0.150×0.025	...	3.81×0.62

Antennæ about the length of the thorax; dark brown, almost black; pubescence of the flagellar joints hoary when viewed at a certain obliquity; terminal joint with a very small nipple-shaped projection. Hypostoma and proboscis dark brown. Palpi yellowish-brown. Front dark brown or black. Thorax sordid yellowish-brown, opaque, densely covered with short black hairs; lateral borders and scutellum setiferous; pleuræ and metanotum brown or brownish. Halteres brown, the stem yellow. Abdomen deep brown or black, the posterior half of second and following segments ochraceous; densely clothed with black hairs; ♂ forceps ochraceous or sordid ochraceous. Fore coxæ ochreous-yellow; intermediate and hind pairs brown, the intermediate pair tinged with ochreous; all with short black hairs in front. Femora ochreous-yellow, densely covered with very short dark hairs; tibiæ greyish; tarsi almost black. Tibial spurs black. In the fore-legs the tibiæ $\frac{1}{2}$ longer than the metatarsus. Wings rather shorter than the body, hyaline; the apex clouded with pale brownish, intensified into dark brown at tip of third longitudinal

vein and costa; anterior branch of third longitudinal vein enveloped in a small squarish dark brown, almost black cloud; tips of branches of fifth longitudinal vein faintly clouded with pale brownish; the costa and first two longitudinal veins black or deep brown. Costal vein extending beyond the tip of the third longitudinal vein $\frac{1}{2}$ the distance from that to the tip of the anterior branch of the fourth longitudinal vein; anterior branch of the third longitudinal vein vertical, its base situated at a point $\frac{1}{3}$ the distance from the tip of the first longitudinal vein to the tip of the third longitudinal; petiole and base of fork and tip of posterior branch of the fourth longitudinal vein pale; auxiliary vein reaching the costa opposite or immediately before the inner end of the marginal cell; both branches of the fifth longitudinal vein not quite reaching the margin; sixth longitudinal vein disappearing half way to the margin.

Hab.—Dunoon, Richmond River (Helms). March.

Obs.—Very unlike any other described Australian species.

148. *PLATYURA FULVA*, Sk.

P. fulva, Sk., l.c., p. 1176.

Two ♂'s and ♀ specimen from Dunoon, Richmond River, N.S.W. (Helms), in March. The abdomen of the ♂ is brown.

Genus *ANTRIADOPHILA*, Sk.

Antriadophila, Sk., l.c., p. 1183, pl. xxxi., fig. 8.

155. *ANTRIADOPHILA NIGRA*, Sk.

A. nigra, Sk., l.c., p. 1188.

Two specimens from Botanical Gardens, Brisbane, Q. (H. Tryon), in March: in *Coll. Queensland Museum*.

Sub-section VI.—*SCIOPHILINÆ*.

Genus *SCIOPHILA*, Meigen.

Sciophila, Meig., l.c., p. 1189.

I. Base of the fork of the fifth longitudinal vein situated before the proximal end of the first posterior cell.

a. *In the fore-legs the tibiae longer than the metatarsus.*

468. *SCIOPHILA* McCoyi, sp.n.

♀.—Length of antennæ.....	0.150 inch	...	3.81 millimètres.
Expanse of wings.....	0.290 × 0.100	...	7.35 × 2.54
Size of body.....	0.270 × 0.060	...	6.85 × 1.54

Antennæ slender, longer than the head and thorax combined; joints of scapus and first three or four flagellar joints ochraceous-yellow, the remaining joints dark brown, with hoary pubescence; flagellar joints $2\frac{1}{2}$ to 3 times longer than broad. Hypostoma, proboscis, and palpi ochraceous-yellow. Front brown, the vertex black. Thorax dark brown, levigate, the humeri and two small spots, one above, the other before, the origin of wings, ochraceous-yellow; three dense convergent rows of black hairs extending to the scutellum, lateral borders and scutellum densely beset with long black hairs, longer on the scutellum; pleuræ brown, with ochraceous markings; scutellum and metathorax ochraceous; the anterior half of metanotum brownish. Halteres yellow, the club brown. Abdomen brown, somewhat shining, all the segments bordered posteriorly with ochraceous-yellow; venter and ovipositor ochraceous yellow. Coxæ ochraceous-yellow, the fore pair more brownish; femora brownish ochreous; tibiae and tarsi cinereous. Tibial spurs black. In the fore-legs the tibiae slightly longer than the metatarsal joint. Wings pellucid, almost hyaline, somewhat infuscated with greyish behind the fork of the fifth longitudinal vein, and between the apical portions of the first and third longitudinal veins; three small, but distinct, brown clouds: one at each end of the marginal cell, the cloud at the proximal end rather larger than the other, reaching the base of fourth longitudinal; the third largest, roundish, enveloping base of fork of fourth longitudinal; also subcostal cross-vein and base of fork of fifth longitudinal vein each with a less distinct, very small

cloud. Auxiliary vein reaching the costa somewhat beyond the middle of the marginal cell ; subcostal cross-vein situated slightly before the middle ; marginal cell not quite $2\frac{1}{2}$ times as long as wide ; petiole scarcely shorter than the posterior branch of the fork ; base of the fork of the fifth longitudinal vein situated considerably before the proximal end of the first posterior cell.

Hab.—Victoria. *Type specimen in the National Museum, Melbourne.*

Obs.—Dedicated to Prof. McCoy, the learned Director of the National Museum of Melbourne, to whom I am indebted for the pleasure of describing this species.

469. *SCIOPHILA PICTITHORAX*, sp.n.

♂.—Length of antennæ.....	0·115 inch	...	2·92 millimètres.
Expanse of wings.....	0·200 × 0·065	...	5·08 × 1·66
Size of body.....	0·180 × 0·035	...	4·56 × 0·88

Antennæ slender, nearly $\frac{1}{3}$ longer than the head and thorax combined ; joints of scapus yellow ; flagellar joints dark brown, almost black, with a hoary pubescence. Hypostoma and proboscis yellow. Palpi deep brown or black. Front brown, the vertex blackish. Thorax ochreous-yellow, with two cuneate brown stripes to middle, and a small round brown spot at each side below the humeri ; the posterior half with two large, almost confluent, somewhat shining, dark brown patches ; beset with scattered black hairs ; pleuræ yellow, the lateral callosity of the metanotum and callosity above the middle coxæ brown ; scutellum dark brown ; metanotum ochreous, tinged with brown on the posterior half. Halteres pale yellow, the club brown. Abdomen brown, the sides and posterior half of second and third segments ochreous-yellow, and the sides and posterior margins of the remaining segments less distinctly ochreous ; rather densely clothed with brown hairs ; venter ochreous-yellow ; forceps brownish-ochreous, densely haired. Coxæ and femora ochreous-yellow, the hind coxæ with a brownish longitudinal spot ; tibiæ brownish ; tarsi brown, the terminal

joints blackish. Tibial spurs black. In the fore-legs the tibiae very slightly longer than the metatarsal joint. Wings almost hyaline, the apex slightly infuscated anteriorly; a brownish cloud enveloping marginal cell and origin of petiole, and a round pale cloud over base of fork; the extreme base of fork of fifth longitudinal slightly brown. Auxiliary vein terminating before the distal end of marginal cell, the subcostal cross-vein at its tip; marginal cell about $\frac{1}{2}$ longer than wide; petiole much shorter than the posterior branch of the fork; base of the fork of the fifth longitudinal vein situated before the proximal end of the first posterior cell.

Hab.—Mossman's Bay, near Sydney (Skuse). August.

470. *SOIOPHILA RICHMONDENSIS*, sp.n. (Pl. xix., fig. 3).

♂.—Length of antennæ.....	0·115 inch	...	2·92 millimètres.
Expanse of wings.....	0·150 × 0·060	...	3·81 × 1·54
Size of body.....	0·155 × 0·030	...	3·92 × 0·76
♀.—Length of antennæ.....	0·105 inch	...	2·67 millimètres.
Expanse of wings.....	0·180 × 0·070	...	4·56 × 1·77
Size of body.....	0·180 × 0·037	...	4·56 × 0·90

♂.—Antennæ slender, rather more than $\frac{1}{2}$ longer than the head and thorax combined; joints of scapus and first one or two flagellar joints fulvous-yellow; remaining flagellar joints dusky brown, with a hoary pubescence. Hypostoma and proboscis fulvous-yellow. Palpi brown or brownish. Front brown, the vertex blackish. Thorax ochreous, somewhat shining, with three cuneate brown stripes; intermediate one geminate, extending beyond the middle, sometimes wanting; lateral ones terminating at scutellum; beset with black hairs; pleuræ slightly tinged with brownish above the intermediate coxæ; scutellum brownish, setiferous; metanotum often brown above. Halteres entirely ochreous-yellow, or the club brown. Abdomen: the first five segments ochreous, deeply bordered posteriorly with black, the remaining two segments

entirely black; ♂ forceps brownish-ochreous. Coxæ and femora ochreous; tibiæ dark cinereous; tarsi black. Tibial spurs black. In the fore-legs the tibiæ longer than the metatarsus. Wings pellucid, the apex clouded with pale greyish; marginal cell more or less clouded with brown, often only its proximal end and small cross-vein; veins brown. Auxiliary vein terminating opposite the middle of marginal cell; the subcostal cross-vein before its tip; marginal cell twice as long as wide; petiole about $\frac{1}{5}$ longer than the posterior branch of the fork; base of the fork of the fifth longitudinal vein situated a little before the proximal end of first posterior cell.

♀.—Antennæ somewhat longer than the head and thorax combined. Thorax with the intermediate stripe very indistinct or wanting. Lamellæ of ♀ ovipositor brownish-ochreous. Marginal cell usually deeply clouded. Petiole very little longer than the posterior branch of the fork.

Hab.—Dunoon, Richmond River, N.S.W. (Helms). Several specimens in March and April.

471. SCIOPHILA HUMERALIS, sp.n.

♂.—Length of antennæ..... 0·110 inch ... 2·79 millimètres.
 Expanse of wings..... 0·135 × 0·050 ... 3·42 × 1·27
 Size of body..... 0·150 × 0·030 ... 3·81 × 0·76

Antennæ slender, considerably longer than the head and thorax combined; joints of scapus and basal half of first flagellar joint yellow; remaining flagellar joints dusky brown, with a hoary pubescence. Hypostoma brown. Proboscis and palpi yellow. Front black or deep brown. Thorax black or deep brown, somewhat shining, yellow at the humeri; beset with black hairs; pleuræ deep brown, yellow immediately beneath the origin of the wings; scutellum and metanotum deep brown. Halteres pale yellow, the club deep brown. Abdomen black or deep brown, the first five segments brownish-yellow anteriorly; somewhat shining, densely clothed with black hairs; ♂ forceps brownish-yellow.

Coxæ and femora pale yellow, the hind femora infuscated with brownish at the base; tibiæ dark greyish; tarsi black. Tibial spurs black. In the fore-legs the tibiæ $\frac{1}{2}$ longer than the metatarsus. Wings pellucid, almost hyaline; veins black or deep brown. Auxiliary vein terminating in the costa somewhat beyond the middle of the marginal cell; the sub-costal cross-vein situated mid-way between the tip of the auxiliary vein and the proximal end of marginal cell; marginal cell twice as long as wide; petiole equal in length to the anterior branch of the fork; base of the fork of the fifth longitudinal vein situated a little before the proximal end of first posterior cell.

Hab.—Hogan's Brush, Narara Creek, near Gosford, N.S.W. (Skuse). August.

II. Base of the fork of the fifth longitudinal vein situated opposite the proximal end of the first posterior cell.

a. *In the fore-legs the tibiæ longer than the metatarsus.*

472. *SCIOPHILA SYLVICOLA*, sp.n.

♂.—Length of antennæ..... 0·130 inch ... 3·30 millimètres.
 Expanse of wings..... .. 0·180 × 0·170 ... 4·56 × 1·77
 Size of body..... 0·200 × 0·035 .. 5 08 × 0·88

Antennæ moderately robust, considerably longer than the head and thorax combined; joints of scapus and base of first flagellar joint yellow; remaining flagellar joints dark brown, with a hoary pubescence. Hypostoma, proboscis, and palpi sordid yellowish-brown. Front sordid yellowish, the vertex dark brown. Thorax brown, somewhat shining, with three convergent longitudinal indistinct paler lines, beset with double rows of black hairs; lateral borders and scutellum setiferous; pleuræ considerably tinged with sordid ochreous-yellow. Halteres yellow, the club brownish. Abdomen black or deep brown, somewhat shining, the first five or six segments more or less distinctly marked at the sides with yellowish brown or reddish-fulvous; densely clothed with black hairs. Coxæ and femora sordid ochreous, tibiæ

cinereous; tarsi black. Tibial spurs black. In the fore-legs the tibiæ about $\frac{1}{4}$ longer than the metatarsus. Wings pellucid, with a slightly greyish tint; veins deep brown. Auxiliary vein terminating in the first longitudinal vein at about the middle of the marginal cell; subcostal cross-vein wanting; marginal cell more than twice as long as wide; petiole about $\frac{1}{8}$ longer than the posterior branch of the fork; base of the fork of the fifth longitudinal vein situated opposite the proximal end of first posterior cell.

Hab.—Mossman's Bay, near Sydney (Skuse). August.

Genus NEOEMPHERIA, Osten-Sacken.

Empheria (*præoc.*), Winnertz, V. z.-b. G. Wien, XIII., p. 738, pl. xix., figs. 9a-b., 1863; *Neoempheria*, O.-Sack., Catl. Dipt. N. Amer., 2nd ed., p. 9, 1878.

Agrees almost entirely with *Sciophila*, differs in the following:—Eyes round; antennæ somewhat compressed, cylindrical; the spine on the intermediate coxæ of ♂ always wanting; costal vein extending beyond the tip of the third longitudinal vein, but not reaching as far as the apex of the wing; auxiliary vein joining sometimes somewhat beyond the marginal cell; base of the wings sometimes obtusely cuneiform.

473. NEOEMPHERIA SIGNIFERA, sp.n. (Pl. xix., fig. 4).

♂.—Length of antennæ.....	0·035 inch	...	0·88 millimètre.
Expanse of wings.....	0·110 × 0·040	...	2·79 × 1·01
Size of body.....	0·120 × 0·025	...	3·04 × 0·62
♀.—Length of antennæ.....	0·035 inch	...	0·88 millimètre.
Expanse of wings.....	0·110 × 0·040	...	2·79 × 1·01
Size of body.....	0·120 × 0·025	...	3·04 × 0·62

♂ and ♀.—Antennæ short, rather slender, about the length of the thorax; joints of scapus and first one or two flagellar joints yellow; remaining flagellar joints brown, with a minute pale pubescence. Hypostoma and proboscis brown or brownish.

Palpi dark brown or black. Front brown; the ocelli situated on a black spot. Thorax brown, levigate, sometimes with three indistinct, narrow dark brown stripes to the scutellum; covered with black hairs; lateral borders setiferous; pleuræ pale ochreous; scutellum brownish-ochreous or pale brownish; metathorax deep brown or black. Halteres yellow, the club sometimes slightly infuscated. Abdomen black, somewhat shining, the first segment, the incisions, and a more or less distinct lateral spot on the fourth segment, yellow; clothed with black hairs; venter and genitalia ochreous or brownish-ochreous. Coxæ and fore and intermediate femora yellow, the latter rather greyish on account of their pubescence; hind femora dark brown; tibiæ cinereous; tarsi black. Tibial spurs black. In the fore-legs the tarsi more than twice the length of the tibiæ; the tibiæ somewhat longer than the metatarsal joint. Wings hyaline, with a brown fascia before the middle, and the apex entirely infuscated; brilliantly iridescent; veins dark brown. Costal vein extending beyond the tip of the third longitudinal vein less than $\frac{1}{2}$ the distance from that to the tip of the anterior branch of the fork; auxiliary vein joining the costa about opposite the middle of the marginal cell; sub-costal cross-vein immediately before the marginal cell, the latter very little longer than wide; a supernumerary longitudinal vein or incrassated wing-fold from the inner end of the first posterior cell, not reaching the margin, running nearer to the fourth than to the third longitudinal vein; petiole a little shorter than the posterior branch of the fork; the latter with the branches straight, divaricate; base of the fork of the fifth longitudinal vein situated a little before the proximal end of the first posterior cell.

Hab.—Dunoon, Richmond River, N.S.W. (Helms). March and April. Specimens taken *in copula*.

STENOPHRAGMA, gen. nov.

Homaspis (*præoc.* Förster, Hym., 1869), Sk., l.c., p. 1191, pl. XXXI, figs. 99b.

Since the name *Homaspis* was proposed for this genus, it has been ascertained from the 'Zoological Record,' 1888, recently to hand, that Förster had previously employed the same for one of his numerous divisions of Ichneumonidæ (Verh. Ver. Rheinl., XXV., p. 198, 1869); consequently this genus has to be re-named.

474. STENOPHRAGMA PICTICORNIS, sp.n. (Pl. XIX., fig. 5).

♂.—Length of antennæ.....	0·160 inch	...	4·06 millimètres.
Expanse of wings.....	0·220 × 0·083	...	5·58 × 2·09
Size of body.....	0·240 × 0·040	...	6·09 × 1·01

Antennæ slender, more than half the length of the entire body ; joints of the scapus yellow ; flagellar joints 2 to 4 times as long as broad, brown, broadly ringed with yellow in the middle, densely covered with a very short greyish pubescence. Front and vertex black or deep brown, with some golden-yellow hairs. Hypostoma and palpi black or deep brown, the terminal joints of the latter yellowish-brown. Thorax deep brown with a (sometimes indistinct) median testaceous or ochraceous stripe, and indistinct lateral stripes ; densely covered with yellowish hairs ; borders setiferous with black hairs ; pleuræ, scutellum and metathorax deep brown, sometimes with an indistinct yellowish spot above the fore and intermediate coxæ. Halteres yellow, the club black. Abdomen slender, deep brown, rather densely clothed with brown or blackish hairs ; forceps yellowish, tinged with brown, densely haired. Coxæ deep brown ; femora, tibiæ and tarsi brownish-yellow. Tibial spurs yellow. In the fore-legs the tarsi more than twice the length of the tibiæ ; the tibiæ and metatarsal joint of equal length. Wings pellucid, with numerous pale brown cloudings, darker brown over the marginal cell ; posterior basal cell clear from its base to the base of the fifth longitudinal vein, where it meets an irregular clear fascia which broadens as it reaches the costa ; an irregular clear fascia across the apex of the wing, from immediately beyond the tip of the first longitudinal vein ; two or three clear streaks behind the fifth longitudinal vein, in the

posterior angle; and a clear spot near the distal end of the anterior basal cell, another in the fork of the fifth longitudinal vein, and a third at the apex of the wing, beneath the tip of the third longitudinal vein; veins brown. Auxiliary vein joining the costa a little beyond the distal end of the marginal cell; sub-costal cross-vein situated opposite inner end of the marginal cell; first longitudinal vein reaching the costa opposite the tip of the posterior branch of the fourth longitudinal vein; marginal cell nearly twice as long as wide; costal vein extending beyond the tip of the third longitudinal vein about $\frac{2}{3}$ the distance from that to the tip of the anterior branch of the fourth longitudinal vein; posterior branch of the fork of the fifth longitudinal vein sinuated, a little more than half the length of the anterior branch; sixth longitudinal vein not reaching as far as the base of the fork of the fifth longitudinal vein; seventh longitudinal vein wanting.

Hab.—Gawler (Mrs. Kreusler), and Mount Lofty (J. G. O. Tepper), S. Australia; *one specimen in Coll. S. Aust. Museum.* June.

femora and tibiæ yellow ; tarsi brown. In the fore-legs the tarsi more than twice the length of the tibiæ ; the tibiæ and metatarsal joint of equal length. Wings nearly the length of the entire body, pellucid, with the following cloudings :—a greyish or very pale brownish cloud over the marginal cell, and another behind the posterior branch of the fifth longitudinal vein ; a very indistinct, scarcely visible fascia from the costa to basal portion of anterior branch of fifth longitudinal vein, and a greyish or pale brownish fascia across the wing from tip of first longitudinal vein to tip of anterior branch of the fork of the fifth longitudinal vein ; apex of wing clouded with greyish or pale brownish ; microscopical pubescence densely intermixed with short hairs ; veins brown. Auxiliary vein joining the costa somewhat before the distal end of the marginal cell ; sub-costal cross-vein situated somewhat before the inner end of the marginal cell ; first longitudinal vein reaching the costa opposite a point about mid-way between the tips of posterior branch of the fourth and anterior branch of the fifth longitudinal veins ; marginal cell very small, not square, wider anteriorly ; costal vein extending beyond the tip of the third longitudinal vein about $\frac{1}{6}$ the distance from that to the tip of the anterior branch of the fork of the fourth longitudinal vein ; posterior branch of the fork of the fifth longitudinal vein less than half the length of the anterior branch ; sixth longitudinal vein terminating a considerable distance before the base of the fork of the fifth longitudinal vein ; seventh longitudinal vein wanting or very rudimentary.

Hab.—Hogan's Brush, Narara Creek, near Gosford, N.S.W. (Skuse). August.

151. STENOPHRAGMA MERIDIANA, Sk.

Homaspis meridiana, Sk., l.c., p. 1192, pl. xxxi, figs. 9-9b.

SECTION III.

Sub-section VII.—MYCETOPHILINÆ.

A. *Three ocelli on the front.*

posterior angle ; and a clear spot near the distal end of the anterior basal cell, another in the fork of the fifth longitudinal vein, and a third at the apex of the wing, beneath the tip of the third longitudinal vein ; veins brown. Auxiliary vein joining the costa a little beyond the distal end of the marginal cell ; sub-costal cross-vein situated opposite inner end of the marginal cell ; first longitudinal vein reaching the costa opposite the tip of the posterior branch of the fourth longitudinal vein ; marginal cell nearly twice as long as wide ; costal vein extending beyond the tip of the third longitudinal vein about $\frac{2}{3}$ the distance from that to the tip of the anterior branch of the fourth longitudinal vein ; posterior branch of the fork of the fifth longitudinal vein sinuated, a little more than half the length of the anterior branch ; sixth longitudinal vein not reaching as far as the base of the fork of the fifth longitudinal vein ; seventh longitudinal vein wanting.

Hab.—Gawler (Mrs. Kreusler), and Mount Lofty (J. G. O. Tepper), S. Australia ; *one specimen in Coll. S. Aust. Museum.* June.

Obs.—Only two specimens before me.

476. *STENOPHRAGMA HIRTIPENNIS*, sp.n.

♂.—Length of antennæ.....	0·070 inch	...	1·77 millimètres.
Expanse of wings.....	0·130 × 0·042	...	3·30 × 1·06
Size of body.....	0·140 × 0·020	...	3·35 × 0·50

Antennæ slender, longer than the head and thorax combined ; joints of the scapus yellow ; flagellar joints about 3 times as long as wide, yellowish-brown, densely covered with a minute pale pubescence. Front and vertex dark brown, with yellowish hairs. Hypostoma brown or yellowish-brown. Palpi dark brown. Thorax umber-brown, somewhat shining, covered with short golden-yellow hairs ; borders setiferous ; pectus ochreous-yellow ; scutellum and metanotum umber-brown. Halteres pale yellow, with deep brown or black club. Abdomen slender, dark brown, densely clothed with brown hairs ; forceps sordid yellowish-brown. Coxæ,

femora and tibiæ yellow ; tarsi brown. In the fore-legs the tarsi more than twice the length of the tibiæ ; the tibiæ and metatarsal joint of equal length. Wings nearly the length of the entire body, pellucid, with the following cloudings :—a greyish or very pale brownish cloud over the marginal cell, and another behind the posterior branch of the fifth longitudinal vein ; a very indistinct, scarcely visible fascia from the costa to basal portion of anterior branch of fifth longitudinal vein, and a greyish or pale brownish fascia across the wing from tip of first longitudinal vein to tip of anterior branch of the fork of the fifth longitudinal vein ; apex of wing clouded with greyish or pale brownish ; microscopical pubescence densely intermixed with short hairs ; veins brown. Auxiliary vein joining the costa somewhat before the distal end of the marginal cell ; sub-costal cross-vein situated somewhat before the inner end of the marginal cell ; first longitudinal vein reaching the costa opposite a point about mid-way between the tips of posterior branch of the fourth and anterior branch of the fifth longitudinal veins ; marginal cell very small, not square, wider anteriorly ; costal vein extending beyond the tip of the third longitudinal vein about $\frac{1}{8}$ the distance from that to the tip of the anterior branch of the fork of the fourth longitudinal vein ; posterior branch of the fork of the fifth longitudinal vein less than half the length of the anterior branch ; sixth longitudinal vein terminating a considerable distance before the base of the fork of the fifth longitudinal vein ; seventh longitudinal vein wanting or very rudimentary.

Hab.—Hogan's Brush, Narara Creek, near Gosford, N.S.W. (Skuse). August.

151. STENOPHRAGMA MERIDIANA, Sk.

Homaspis meridiana, Sk., l.c., p. 1192, pl. xxxi, figs. 9-9b.

SECTION III.

Sub-section VII.—MYCETOPHILINÆ.

A. *Three ocelli on the front.*

Genus ACRODICRANIA, Sk.

Acrodicrania, Sk., l.c., p. 1194, pl. XXXII., figs. 10-10a.

477. ACRODICRANIA ANGUSTIFURCA, sp.n.

♀.—Length of antennæ.....	0·045 inch	...	1·13 millimètres
Expanse of wings.....	0·125 × 0·045	...	3·16 × 1·13
Size of body.....	0·120 × 0·020	...	3·04 × 0·50

Antennæ moderately slender, about the length of the head and thorax combined; joints of the scapus and base of the first flagellar joint yellow; flagellar joints brown, with a minute hoary pubescence. Hypostoma dark brown. Palpi yellow. Front dark brown or black. Thorax brown, more yellowish at the humeri, levigate, densely covered with long and short brown hairs; pleuræ and metathorax dark brown or blackish. Halteres clear yellow. Abdomen dark brown or black, the segments (first two) with almost the anterior half yellow, clothed with brown or blackish hairs; lamellæ of the ovipositor deep brown. Coxæ and femora yellow, the hind femora deep brown or black at the apex; tibiæ yellowish-grey; tarsi dusky, the metatarsal joint lighter. Tibial spurs yellow; the lateral spines black. In the fore-legs the tibiæ $\frac{1}{2}$ longer than the metatarsal joint; the tarsi about $\frac{2}{3}$ longer than the tibiæ. Wings pellucid, with a very pale greyish tint; an indistinct fascia of pale brownish near the tip, immediately before the tip of the third longitudinal vein, disappearing before the posterior margin; veins dark brown. Auxiliary vein joining the costa before the inner end of the first posterior cell; first longitudinal vein joining the costa considerably beyond the base of the fork; the cross-vein opposite the latter; costal vein extending beyond the tip of the third longitudinal vein $\frac{1}{2}$ the distance from that to the tip of the anterior branch of the fork; fork of the fourth longitudinal vein rather narrow, the branches running almost parallel towards the tips; the tips pale; rudimentary sixth longitudinal vein and a short stump of seventh longitudinal vein present.

Hab.—Mossman's Bay (Skuse). September.

Obs.—Closely related to *A. fasciata*, Sk., but easily distinguished *inter alia* by the shape of the fork of the fourth longitudinal vein.

158. ACRODICRANIA ATRICAUDA, Sk.

A. atricauda, Sk., l.c., p. 1195, pl. xxxii., fig. 10.

Specimens have been received from the following additional localities :—Waterloo, Walcha, New England district, N.S.W. (J. F. Schofield), in June : Glass Mountains, Queensland (C. J. Wild), in September ; *specimens in Coll. Queensland Museum.*

160. ACRODICRANIA FASCIATA, Sk.

A. fasciata, Sk., l.c., p. 1198.

Very abundant in Sydney during June of the present year. Also, I have bred this species in numbers from decaying wood-débris in November. A single specimen was recently obtained at Benalla, Victoria (Helms).

CLASTOBASIS, gen.nov.

Head roundish, flattened in the fore part, situated deep in the thorax ; front broad, the anterior border produced triangularly, the point between the joints of the scapus ; vertex high. Eyes oval. Ocelli large, the middle one smaller, situated almost in line with but somewhat behind the other two. Palpi prominent, four-jointed ; first joint small, second tolerably long and robust, third a little longer than the second, more slender, fourth very long and slender, about equal in length to the second and third combined. Antennæ slender, porrected, arcuated, 2- + 14-jointed ; first joint of the scapus obconical, longer than the second, the second cupuliform, both setiferous at the apex ; flagellar joints cylindrical, progressively diminishing in thickness, with minute downy pubescence. Thorax ovate, highly arched, hairy ; lateral borders setiferous ; scutellum lunate, setiferous ; metanotum large, acclivous. Abdomen (of the ♀) seven-segmented, somewhat

flattened, narrowed at the base and towards the extremity; ovipositor short, thick, inconspicuous; legs long and slender; intermediate and hind femora moderately broad; tibiae spurred, and with lateral spines; fore pair with some minute spines along the outer side, intermediate pair with two sparse rows of long spines on the outer and some very small spines on the inner side, hind pair with two sparse rows of long spines and a row of very short spines on the outer side; in the hind-legs the tibiae and tarsi of about equal length. Wings a little longer than the entire body, moderately broad, with rounded off base; microscopically pubescent. Auxiliary vein moderately long, the apical two-thirds of its length very pale and indistinct, directed towards, but not reaching the costa; sub-costal cross-vein invisible; costal vein not extending beyond the tip of the third longitudinal vein, terminating considerably before the apex of the wing; inner end of first posterior cell situated opposite the middle of the first longitudinal vein; the distance from the inner end of the first posterior cell to the distal end of the anterior basal cell about $\frac{1}{3}$ longer than the distance from the latter to the tip of the first longitudinal vein; inner end of the second posterior cell situated a little before the distal end of anterior basal cell; the fork of fourth longitudinal vein with a tolerably long petiole, the branches somewhat convergent towards the tips, the anterior one reaching the margin much below the apex of the wing; anterior branch of the fifth longitudinal vein detached at its base, the base situated considerably before the inner end of the first posterior cell and opposite the tip of the auxiliary vein; sixth longitudinal vein long, incomplete; seventh longitudinal vein a mere stump.

Obs.—Allied to *Acrodicrania*, Sk., *Leia*, Meig., and *Ateleia*, Sk., but at once distinguished from each by the incomplete auxiliary vein, the length and shape of the second posterior cell, and by the costal vein not extending beyond the tip of the third longitudinal vein. The following described is remarkable for its party-coloured antennal joints.

478. *CLASTOBASIS TRYONI*, sp.n. (Pl. xix., fig. 6.)

♀.—Length of antennæ.....	0·045 inch	...	1·13 millimètres.
Expanse of wings.....	0·135 × 0·045	...	3·42 × 1·13
Size of body.....	0·130 × 0·030	...	3·30 × 0·76

Antennæ slender, shorter than the head and thorax combined ; joints of the scapus yellow ; flagellar joints with the basal half white and the apical half black or deep brown, densely covered with a pale microscopic pubescence. Front ochreous or brownish-ochreous, with yellowish hairs ; ocelli black, distinct, especially the lateral ones. Hypostoma and palpi yellow. Thorax ochreous or brownish-ochreous, somewhat shining, densely covered with yellowish hairs ; lateral borders setiferous ; pleuræ and scutellum ochreous or brownish-ochreous, the latter with two long brown setæ ; metanotum tinged with brown. Halteres yellow. Abdomen ochraceous or yellowish-brown, the segments bordered posteriorly, sometimes also marked in the middle, with deep brown or black ; densely covered with short brown hairs ; genitalia inconspicuous. Legs long. Coxæ and femora ochreous ; tibiæ and tarsi brownish- or greyish-ochreous ; tibial spurs brownish-ochreous, the lateral spines brown. In the fore-legs the tarsi $2\frac{1}{2}$ times the length of the tibiæ ; the tibiæ and the metatarsal joint of equal length. Wings longer than the abdomen, pellucid, with a pale yellowish tint, which is more pronounced anteriorly ; brilliant reflections ; veins yellowish-brown. Venation as described in the generic diagnosis.

Hab.—Brisbane, Queensland (H. Tryon) ; two specimens found on a window in March ; *in Coll. Queensland Museum.*

B. Three ocelli, one on the inner border of each of the compound eyes, the third one situated in the middle of the anterior border of the front.

Genus *SCEPTONIA*, Winnertz.

Sceptonia, Winn., V. z.-b. G. Wien, XIII. p. 907, pl. xxi. fig. 33, 1863.

Head longish-round, flattened, situated deep in the thorax; front broad, the anterior border produced triangularly in the middle, the point reaching the base of the antennæ. Eyes small, round. Ocelli small, the middle one very small, situated in a depression at the base of the frontal triangle. Palpi porrected, arcuated, four-jointed, the first joint very small, the fourth the longest. Antennæ almost cylindrical, slender, arcuated, porrected, 2- + 14-jointed; joints of the scapus cyathiform, setiferous at the apex; flagellar joints cylindrical, somewhat compressed from the side, with a short downy pubescence. Thorax longish-oval, arched, with the anterior border projecting a little over the head, and frequently forming with it an uninterrupted arcuated line; mesothorax with short hair, not setiferous, only some long hairs at the sides before and behind the origin of the wings; scutellum semi-circular, setiferous on the border; metathorax small, somewhat pointed. Abdomen of the ♂ with six segments, of the ♀ with seven segments, the seventh segment always retracted; short, broadly compressed from the side, strongly narrowed at the base, truncated at the extremity; anal segment of the ♂ very small, usually entirely withdrawn; ovipositor of the ♀ short, small, with two longish oval lamellæ. Legs robust; coxæ and femora broad; tibiæ almost clavate, with strong spurs at the apex; fore tibiæ without lateral spines; intermediate tibiæ with a weak spine on the inner side; hind tibiæ with two rows of strong spines on the outer side; metatarsi of the hind legs spinulose. Wings longer than the abdomen, longish-oval, with broadly-cuneiform base, microscopically pubescent. Auxiliary vein incomplete, bent anteriorly, gradually disappearing; costal vein extending beyond the tip of the third longitudinal, terminating much before the apex of the wing; the third longitudinal vein arched, running almost parallel with the costa; the costa and first and third longitudinal veins lying close together; apex of anterior basal cell not situated beyond the middle of the petiole of the fourth longitudinal fork; anterior branch of the fifth longitudinal wanting, therefore no fork; sixth longitudinal vein wanting; seventh longitudinal very long.

479. *SCEPTONIA ORNATITHORAX*, sp.n.

♀.—Length of antennæ.....	0·035 inch	...	0·88 millimètre.
Expanse of wings.....	0·090 × 0·035	...	2·27 × 0·88
Size of body.....	0·100 × 0·021	...	2·55 × 0·52

Antennæ slender, nearly as long as the head and thorax taken together; joints of the scapus and base of first flagellar joint yellow; flagellar joints dusky brown, with a dense, somewhat hoary, pubescence. Head dark brown, yellow at the sides and anteriorly. Hypostoma and palpi yellow. Thorax yellow anteriorly with a median cuneate, translucent, shining brown, very slightly raised elevation, not extending half-way to the scutellum; hinder portion of thorax black with a large yellow spot laterally, immediately in front of the base of the wings; almost opaque; densely covered with very short, golden-yellow hairs; pleuræ yellow, with a black spot immediately before the origin of the wings, and tinged with brown above the coxæ; scutellum and metathorax black, the former with black setæ. Halteres yellow. Abdomen brown, the first segment entirely yellow and the following segments slightly bordered posteriorly with ochreous-yellow; densely clothed with brown hairs; venter yellow. Coxæ and femora pallid; in the hind-legs the coxæ deep brown or black at the base, and the femora margined behind with deep brown or black; anterior coxæ and all the femora densely covered with dark minute pubescence; tibiæ cinereous; tarsi black. Tibial spurs black. In the fore- and intermediate-legs the femora rather shorter and narrower than the coxæ; in the hind-legs rather broader and longer. Hind tibiæ twice the length of the fore pair; the latter about equal in length to the metatarsi of the fore-legs. Intermediate tibiæ with one, hind tibiæ with two rows of spines on the outer side. Metatarsi of the hind-legs spinulose. Wings pellucid, with a slightly yellowish tint; brilliantly iridescent; veins dark brown. Costal vein extending beyond the tip of the third longitudinal vein less than half the distance from that to the tip of the anterior branch of the fork; auxiliary vein very

short, bent anteriorly; petiole short, forming a straight line with the posterior branch of the fork; both branches apparently, but not quite, reaching the margin; fifth longitudinal vein straight, without a branch; seventh longitudinal vein nearly reaching the margin.

Hab.—Sydney (Skuse). A single specimen found on a window in June.

c. Two ocelli, one on the inner border of each of the compound eyes.

Genus MYCETOPHILA, Meigen.

Mycetophila, Meig., l.c., p. 1211, pl. xxxii., figs. 15-15a.

480. MYCETOPHILA NIGRIVENTRIS, sp.n.

♀.—Length of antennæ.....	0·073 inch	...	1·85 millimètres.
Expanse of wings.....	0·150 × 0·055	...	3·81 × 1·39
Size of body.....	0·150 × 0·035	...	3·81 × 0·88

Antennæ slender, longer than head and thorax taken together; joints of scapus and (sometimes) first flagellar joint yellow, both joints of scapus with short black bristles at the apex; flagellar joints brown. Hypostoma and front black, the latter with a yellow pubescence. Palpi yellow. Thorax brown, opaque, densely covered with brown and yellowish pubescence; black setæ laterally; pleuræ and metathorax black or deep brown; scutellum ochraceous, tinged with brown, with long black setæ. Halteres pale yellow. Abdomen much compressed from the sides, black, the last three or four segments sometimes slightly bordered posteriorly with ochraceous; densely clothed with yellowish hairs; ovipositor and terminal lamellæ brown. Legs robust. Coxæ, femora and tibiæ yellow; the hind femora slightly tipped with dark brown at the apex; tibiæ slightly more brownish-yellow than the preceding joints, the hind pair slightly tipped with dark brown at the apex; fore tibiæ with a few minute spines on the outer side, the intermediate with three ranges of long black spines, one on the inner and two on the outer side, and the hind pair with two ranges on

the outer side ; tarsi brown. Tibial spurs deep brown or black. In the fore-legs the tarsi twice the length of the tibiae, the latter somewhat longer than the metatarsal joint. Wings the length of entire body, pellucid, slightly yellow anteriorly ; a small distinct brown spot between the first longitudinal vein and petiole of the fork of the fourth longitudinal, including the small cross-vein ; a paler clouding between the tips of the costal and third longitudinal veins, extending backwards in the first posterior cell and reaching the anterior branch of the fork about the middle ; basal portion of the fork indistinctly clouded ; and lastly, one or two very indistinct clouds between the fourth and fifth longitudinal veins. Inner end of the second posterior cell opposite that of the sub-marginal ; base of the fork of the fifth longitudinal vein situated opposite the inner end of second posterior cell ; sixth longitudinal vein not reaching the base of the fork of the fifth longitudinal vein.

Hab.—Hogan's Brush, Narara Creek, Gosford, N.S.W. (Skuse), one specimen in August ; Mount Kosciusko, N.S.W., 5000 ft. (Helms), March ; *a single specimen in Coll. Australian Museum.*

Genus *DELOPSIS*, gen.nov.

Head somewhat longish-round, flattened, situated deep in the thorax ; front broad, the anterior border produced triangularly in the middle, the point reaching the basal joints of the antennae. Eyes oval. Ocelli two, large. Palpi prominent, incurved, four-jointed ; first joint small, second robust, about two and a half times the length of the first, third slender, clavate, about the length of the first two combined, fourth very slender, clavate, the length of the first three combined. Antennae porrected, arcuated, 2- + 14-jointed ; first joint of the scapus obconical, much longer than the second, the second cyathiform, setiferous at the apex ; flagellar joints cylindrical, progressively diminishing in thickness, with a short downy pubescence. Thorax longish-ovate, gibbose, the anterior margin projecting somewhat over and closely applied

to the head (as in *Sceptonia*); densely covered with short longitudinally disposed hairs; setiferous about the origin of the wings; scutellum semi-circular, with long setæ; metanotum very short, steep, gibbose, almost hidden by the scutellum. Abdomen with six segments in both sexes; somewhat flattened; narrower than the thorax; narrowing at the base and apex; genitalia not conspicuous in either sex. Legs robust; coxæ broad; femora short, broadly flattened, especially the hind pair; tibiæ spurred, the fore pair without lateral spines, intermediate pair with three ranges of strong spines on the outer and one on the inner side, hind pair with three ranges of rather stronger spines on the outer side; intermediate and hind tarsi spinulose. Wings about the length of the entire body, elongate, rounded off at the base; microscopically pubescent, the hairs not arranged in longitudinal rows. Auxiliary vein short, complete, bent anteriorly; costal vein not extending beyond the tip of the third longitudinal vein and not reaching the apex of the wing; small cross-vein situated much before the middle of the first longitudinal vein; petiole of the second posterior cell very short, equal in length to cross-vein; inner end of second posterior cell acute, situated opposite inner end of submarginal cell; fork of the fifth longitudinal vein very long, narrow, acute at the base, with the branches straight, its inner end situated before the middle of the anterior basal cell; sixth longitudinal vein short, incomplete; seventh strong, complete.

Obs.—Allied to *Mycetophila*, Meig.; differing in the shape of the thorax and in the venation of the wings, and at once distinguished by the length of the fork of the fifth longitudinal vein and the complete seventh longitudinal vein.

481. *DELOPSIS FLAVIPENNIS*, sp.n. (Pl. XIX., fig. 7).

♂.—Length of antennæ.....	0·050 inch	...	1·27 millimètres.
Expanse of wings.....	0·120 x 0·045	...	3·04 x 1·13
Size of body.....	0·120 x 0·035	...	3·04 x 0·88

♀.—Length of antennæ.....	0·060 inch	...	1·54 millimètres.
Expansé of wings.....	0·130 × 0·045	...	3·30 × 1·13
Size of body	0·150 × 0·037	...	3·81 × 0·90

♂ and ♀.—Antennæ slender, nearly as long as the head and thorax combined; joints of scapus brownish-yellow, minutely pubescent, somewhat setose at the apex; flagellar joints brown, microscopically pubescent, progressively decreasing in thickness and slightly increasing in length. Hypostoma and front ochreous-brown, the latter somewhat shining, densely covered with minute pubescence. Palpi yellow. Thorax dark brown, or black, levigate, ochreous or ochreous-brown anteriorly and at the humeri; densely covered with very short yellowish-brown hairs; pleuræ dark brown, ochraceous or ochreous-brown above the fore-coxæ, and before and beneath the origin of the wings; scutellum tinged with ochraceous, with long black setæ; metanotum dark brown or black. Halteres yellow. Abdomen brown, with a somewhat silky gloss, the segments appearing ochraceous-brown bordered posteriorly with deep brown when viewed at a certain obliquity; densely clothed with brown decumbent hairs; venter and genitalia ochreous or ochreous-brown. Legs robust. Coxæ and femora ochreous; the base of the hind coxæ dark brown; and the hind femora with the outer margin tinged with brown; tibiæ brownish-ochreous, with brown spurs and spines; tarsi brown, blackish towards the extremity. In the fore-legs the tarsi three times the length of the tibiæ; the metatarsal joint nearly $\frac{1}{2}$ longer than the tibiæ. Wings pellucid, with a yellowish tint; brilliant opaline reflections; veins dark brown. Small cross-vein at one-third the length of the first longitudinal vein; branches of both forks straight and gently divergent; the inner end of the fork of the fifth longitudinal vein situated before the middle of the anterior basal cell; sixth longitudinal vein incomplete, terminating a little beyond the inner end of the fork of the fifth longitudinal vein; seventh longitudinal vein strong, complete.

Hab.—Dunoon, Richmond River, N.S.W. (Helms). March.

Genus DYNATOSOMA, Winnertz.

Dynatosoma, Winn., V. z b. G. Wien, XIII., p. 947, pl. xxi., fig. 37, 1863.

Head, on account of the height of the vertex, somewhat longish-round, flattened anteriorly, situated deep in the thorax; front broad, the anterior margin not triangularly produced. Eyes somewhat longish-round. Ocelli large. Palpi porrected, incurved, four-jointed; the first joint small, the second and third almost equally long, the fourth filiform, as long as or longer than the second and third combined. Antennæ almost cylindrical, somewhat arcuated, porrected, 2-+14-jointed; joints of the scapus cyathiform, setiferous at the apex; flagellar joints cylindrical, a little compressed from the side, with short downy pubescence. Thorax oval, highly arched, with a short pubescence, longer hair on the lateral borders and above the fore-coxae, setiferous on the hind border; scutellum semi-circular, setiferous on the border; metathorax acclivous, somewhat arched. Abdomen of the ♂ with six segments, of the ♀ with seven segments, compressed from the side, narrowed at the base; anal segment of ♂ terminating in a forceps; ♀ ovipositor with two small lamellæ. Legs robust; femora, especially the hind ones, broadly compressed; tibiæ spurred; the fore pair with a short spine on both the inner and the outer side; the hind pair with three rows of stronger spines on the outer side and one row of weaker spines on the inner side, or else with only one or two stronger spines on the inner side, hind tarsi spinulose. Wings longer than the abdomen, longish-oval, base rounded off, microscopically pubescent. Auxiliary vein running parallel with the first longitudinal vein, and bent downwards into it, costal vein not extending beyond the tip of the third longitudinal vein; small cross-vein situated before the middle of the first longitudinal vein, and before or over the base of the fork of the fourth longitudinal vein; branches of the fifth longitudinal not convergent, the base of the fork opposite or beyond the base of the fork of the fourth longitudinal vein; sixth longitudinal very stout, long, broken off under the fork of the fifth longitudinal; seventh longitudinal short.

482. DYNATOSOMA SYDNEYENSIS, sp.n. (Pl. xix., fig. 8).

♀.—Length of antennæ.....	0·045 inch	...	1·13 millimètres.
Expanse of wings.....	0·130 × 0·045	...	3·30 × 1·13
Size of body.....	0·150 × 0·030	...	3·30 × 0·76

Antennæ slender, as long as the head and thorax taken together ; joints of the scapus and base of first flagellar joint ochraceous ; flagellar joints brown, longer than broad, with a hoary pubescence. Front ochreous-brown. Hypostoma and palpi pale yellow. Thorax ochreous-brown, opaque, densely and evenly covered with minute black hairs ; borders setiferous ; pleuræ ochreous with brown callosities ; scutellum brown or brownish, with two black setæ ; metanotum light brownish or ochreous-brown. Halteres pallid or pale ochreous, with a brownish club. Abdomen deep brown or black, the segments bordered posteriorly with ochreous, densely clothed with short black hairs ; anal segment deep brown or black ; lamellæ of the ovipositor elongate, brown. Coxæ and femora ochreous or pale ochreous, the femora infuscated with brownish beneath on the basal half ; tibiæ cinereous or brownish ; tarsi black. Tibial spurs black. Intermediate tibiæ with a row of small spines on the outer side ; hind tibiæ with two rows of strong spines on the outer side. In the fore-legs the tarsi nearly three times the length of the tibiæ ; the metatarsal joint very slightly longer than the tibiæ. Wings pellucid, with a yellowish tint, brilliantly iridescent ; veins dark brown. Auxiliary vein very short, distinct, ending in the first longitudinal vein ; petiole of the fork very short ; the branches of the latter indistinct at the wing margin ; inner end of the second posterior cell opposite that of the marginal cell ; fork of the fifth longitudinal vein divaricate but narrow, its base opposite the inner end of the first posterior cell ; sixth longitudinal vein short, terminating opposite the middle of the anterior basal cell.

Hab.—Sydney (Skuse). Five specimens in June.

Obs.—This species seems to differ from the typical European species *D. fuscicornis*, Meig., and *D. nigricoxa*, Zett., principally

in not having spines on the anterior tibiae, and in the shortness of the auxiliary and sixth longitudinal veins; but these differences are of minor importance.

GENUS BRACHYDICRANIA, Sk.

Brachydiorania, Sk., l.c., p. 1215, pl. xxxi., figs. 16-16a.

483. BRACHYDICRANIA FASCIPENNIS, sp.n. (Pl. XIX., fig. 9).

♂.—Length of antennæ.....	0·045 inch	...	1·13 millimètres.
Expanse of wings.....	0·110 × 0·040	..	2·79 × 1·01
Size of body.....	0·130 × 0·025	...	3·30 × 0·62
♀.—Length of antennæ.....	0·045 inch	...	1·13 millimètres.
Expanse of wings.....	0·130 × 0·045	..	3·30 × 1·13
Size of body.....	0·150 × 0·027	...	3·81 × 0·68

♂ and ♀.—Antennæ slender, as long as the head and thorax combined; joints of the scapus and base of first flagellar joint yellow, with short brown hairs; flagellar joints dusky brown, with a minute hoary pubescence. Front and hypostoma dusky brown, the former with a minute yellowish pubescence. Palpi yellow. Thorax brown, almost opaque, more or less distinctly tinged with ochreous on the margins; densely covered with minute brown or blackish hairs; indistinctly traversed by two convergent, single, sparse rows of black hairs; borders setiferous; pleuræ ochreous, with brown callosities, scutellum and metanotum brown. Halteres pale ochreous or whitish, the club brown (except at the tip). Abdomen deep brown or black, covered with brown hairs; the first segment usually narrowly bordered posteriorly with pale yellowish or whitish; the first and second bordered laterally beneath with yellow; and the third to last usually marked with a more or less distinct triangular yellow spot laterally, more distinctly in the ♀ than in the ♂; genitalia yellowish-brown. Coxæ and femora pale ochreous or whitish; the hind coxæ with a small, more or less distinct, brownish streak

beneath, and the posterior two pairs with a very small brown spot laterally at the apex; tibiæ cinereous; tarsi and tibial spurs black. In the fore-legs the tarsi three times the length of the tibiæ; the metatarsal joint somewhat longer than the tibiæ. Wings pellucid, with a fascia across the middle, and the apex pale brownish; brilliantly iridescent; veins dark brown. First longitudinal vein joining the costa opposite a point before the tip of the posterior branch of the fork of the fourth longitudinal vein; tips of the branches of the latter and the anterior branch of the fork of the fifth longitudinal vein pale; sixth longitudinal reaching nearly to the base of the fork of the fifth.

Hab.—Sydney and Hogan's Brush, Narara Creek, near Gosford, N.S.W. (Skuse). June to August. Fifteen specimens.

171. BRACHYDICRANIA FUMOSA, Sk.

B. fumosa, Sk., l.c., p. 1218.

In fresh specimens the thorax and abdomen are black, the third to sixth abdominal segments being more or less distinctly marked anteriorly at the sides with ochreous.

172. BRACHYDICRANIA ABBREVIATA, Sk.

B. abbreviata, Sk., l.c., p. 1219.

Sydney (May to December), numerous specimens (Skuse); Dunoon, Richmond River, N.S.W. (Helms), in March and April. The ochreous markings beneath the segments vary considerably.

Genus SYNPLASTA, gen.nov.

Head roundish, the fore part compressed, situated deep in the thorax; front broad, the anterior border only very slightly produced in the middle. Eyes longish-round. Ocelli two, tolerably large. Palpi prominent, incurved, four-jointed; first joint very small; second short, robust; third about twice the length of the second; fourth very slender, about equal in length to all the others combined. Antennæ porrected, somewhat arcuated, 2-+14-jointed; joints of scapus cupuliform, the second slightly larger

than the first, somewhat setiferous at the apex; flagellar joints somewhat compressed from the side, densely covered with a minute downy pubescence. Thorax ovate, highly arched, densely covered with a short pubescence; lateral and hind borders setiferous; scutellum semi-circular, setiferous; metathorax steep. Abdomen slender, in the ♂ with six, in the ♀ with seven segments; narrowed at the base; sub-cylindrical, a little compressed from the side; anal joint of the ♂ large; ♀ ovipositor short, with two elongate lamellæ. Legs long and slender; intermediate and hind femora rather broadly compressed; tibiæ spurred, and having lateral spines; fore pair without spines, intermediate pair with a range of small spines on the outer side, hind pair with two ranges of tolerably long spines on the outer side; metatarsus of the hind tarsi with minute prickles. Wings longer than the abdomen, oblong, with moderately rounded base, microscopically haired in longitudinal rows.* Auxiliary vein very short, bent posteriorly, ending in the first longitudinal vein; costal vein extending slightly beyond the tip of the third longitudinal vein; cross-vein situated before the middle of the first longitudinal vein; second posterior cell with a short petiole, its inner end situate opposite that of the submarginal cell; tips of the fourth longitudinal fork somewhat divergent, especially the anterior branch; branches of the fifth longitudinal fork arcuated, the tips not divergent; the fork narrow, its inner end situated a little before that of the second posterior cell; sixth longitudinal vein long, incomplete; seventh longitudinal stout, long, and incomplete.

Obs.—Allied to *Brachydicrania*, Sk., but distinguished from it chiefly by the complete auxiliary vein and the length of the fork of the fifth longitudinal vein.

484. *SYNPLASTA ANNULIVENTRIS*, sp.n. (Pl. XIX., fig. 10.)

♂.—Length of antennæ.....	0·055 inch	...	1·39 millimètres.
Expanse of wings.....	0·125 × 0·047	...	3·16 × 1·18
Size of body.....	0·150 × 0·030	...	3·81 × 0·76

* As in *Mycetophila* and *Brachydicrania*.

♀.—Length of antennæ.....	0·050 inch	...	1·27 millimètres.
Expansé of wings.....	0·125 × 0·047	...	3·16 × 1·18
Size of body.....	0·150 × 0·030	...	3·81 × 0·76

♂ and ♀.—Antennæ slender, as long as the head and thorax combined; joints of the scapus yellow; flagellar joints progressively diminishing in thickness, brown, with a minute hoary pubescence. Front yellowish-brown. Hypostoma and palpi pale yellow. Thorax yellowish-brown, opaque, densely covered with short brown hairs; lateral borders with black setæ; pleuræ ochreous, with brownish callosities; scutellum and metanotum brown or yellowish-brown, the former with black setaceous hairs. Halteres yellow, with brownish club. Abdomen dark brown, all the segments bordered posteriorly with yellow; clothed with dark brown or black hairs; ♂ forceps brownish-ochreous, densely beset with black hairs; ♀ ovipositor and lamellæ brown. Legs long and slender. Coxæ and femora yellow, the latter slightly darker on account of a microscopic pubescence; femora yellowish-cinereous, with brown spurs and black spines; tarsi black or blackish. In the fore-legs the tarsi three times the length of the tibiæ; the metatarsal joint a little longer than the tibiæ. Wings pellucid, with a yellowish tint; brilliantly iridescent; veins brown. First longitudinal vein joining the costa considerably before the tip of the posterior branch of the fork of the fourth longitudinal vein; petiole of the fork very short; inner end of the second posterior cell situated opposite that of the submarginal cell; tips of the branches of the fork of the fifth longitudinal vein not divaricate; the fork narrow, arcuated, its inner end situated a little before that of the second posterior cell, and about opposite the middle of the cross-vein; sixth longitudinal vein reaching beyond the base of the fork of the fifth longitudinal vein; sixth longitudinal vein stout, incomplete.

Hab.—Berowra, N.S.W. (Masters and Skuse). September.

Fam. SIMULIDÆ.

Genus SIMULIUM, Latreille.

Simulium, Latr., l.c., p. 1364, pl. xxxix., figs. 1-1b.

485. SIMULIUM ORNATIPES, sp.n.

♂.—Length of antennæ.....	0·017 inch	...	0·42 millimètre.
Expanse of wings.....	0·105 × 0·050	...	2·67 × 1·27
Size of body.....	0·090 × 0·030	...	2·27 × 0·76
♀.—Length of antennæ.....	0·017 inch	..	0·42 millimètre.
Expanse of wings.....	0·120 × 0·055	..	3·04 × 1·39
Size of body.....	0·100 × 0·035	...	2·54 × 0·88

♂.—Antennæ short, black or dark brown, lighter towards the tip, covered with a microscopic hoary pubescence; the joints of the scapus usually fulvous, sometimes brown or black; 2+9-jointed; first flagellar joint larger than the second joint of the scapus; the next seven joints short; terminal joints narrower, ovate. Eyes, proboscis and palpi black; face hoary, with a silvery-white pubescence. Thorax velvety-black, with two indistinct lines, the lateral margins, a large patch at the humeri, and the posterior portion, covered with shining silvery and golden pubescence; pleuræ and metanotum black; squama behind the halteres densely fringed with long golden-yellow hairs; scutellum covered with silvery and golden pubescence. Halteres pale fulvous or ochreous, the stem brown. Abdomen black, anterior segments sparingly covered, and the last two or three margined posteriorly, with golden pubescence. Fore coxæ yellow, the intermediate and hind pairs yellow, black at the apex, with golden-yellow or silvery pubescence; tibiæ yellow in the middle, black at the base and apex, with golden pubescence; tarsi black, the basal half of the metatarsal and second joint in the hind-legs usually yellow. In the hind-legs the metatarsus robust, longer than the remaining joints of the tarsi. Wings longer than the entire body, hyaline,

with violaceous reflections; costa, first two longitudinal veins and cross-vein brownish, the rest pale. Venation normal.

♀.—Differs from the ♂ as follows:—Head and front with a silvery-white pubescence. Thorax covered with silvery-white pubescence, with three short, broad, dark stripes, the intermediate one traversed by a fine median silvery or golden line. Abdomen tolerably densely covered with silvery-white pubescence.

Hab.—Waterloo Swamps, near Sydney (Skuse), in June; near Louth, Darling River, N.S.W. (Helms), *several specimens in Coll. Australian Museum.*

Obs.—This is the second species of the genus described from Australia. It is at once distinguished from *S. furiosum*, Sk., by the number of joints to the antennæ, the clothing of the body and the coloration of the legs.

Fam. BIBIONIDÆ.

Genus BIBIO, Geoffroy.

Bibio, Geoff., l.c., p. 1366, pl. xxxix., fig. 2.

174. BIBIO IMITATOR, Walker.

Bibio imitator, Walk., l.c., p. 1368, p. xxxix, fig. 2, ♂.

Occurs also in Queensland Botanical Gardens, Brisbane (H. Stokes); *specimen in Coll. Queensland Museum.*

To the synonymy of this species must be added *B. elegans*, Jænnicke (Abh. Natur. Ges. VI., p. 317, 1867), of which I have now seen the description.

I have bred specimens of this species in considerable numbers from earth during the month of September.

Genus PLECIA, Wiedemann.

Plecia, Wied., l.c., p. 1371, pl. xxxix., figs. 3-6.

- I. The anterior branch of the third vein originating near the small cross-vein, and running alongside the posterior branch; body black, the disk of the thorax alone more or less reddish.

486. *PLECIA MELANASPIIS*, Wiedemann.

Penthetria melanaspis, Wied., Auss. Zwf., I., p. 72, 1828; *Crapitula Motschulskii*, Gimmerth., Bull. de Moscou, 1845; *Plecia ignicollis*, Walk., List Dipt. Brit. Mus., I., p. 116, 1848.

♂.—Length of antennæ.....	0·042 inch	...	1·06 millimètres.
Expanse of wings.....	0·350 × 0·135	...	8·88 × 3·42
Size of body.....	0·300 × 0·060	...	7·62 × 1·54

Antennæ short, rather longer than the head, tolerably stout, 2- + 11-jointed, the last flagellar joint small, nipple-shaped; black, with minute hairs. Head, eyes, and palpi black. Thorax black, the posterior two-thirds of the disk reddish-fulvous. Halteres black. Abdomen black, pubescent. Legs black, shining, with a black pubescence; the femora of the hind-legs somewhat dilated towards the tip. Wings brown, ample; stigma not noticeable; veins dark brown. Auxiliary vein joining the costa beyond the proximal end of the first posterior cell; anterior branch of the third longitudinal vein originating close to the small cross-vein, running parallel with the posterior branch for the greater part of its length, and joining the costa considerably beyond the tip of the first longitudinal vein; small cross-vein almost opposite, but slightly beyond, the inner end of second posterior cell; middle cross-vein short, situated very much nearer the base of the fork of the fifth longitudinal vein than to the inner end of the second posterior cell; sixth longitudinal vein complete.

Hab.—N.S.W. A single specimen in the collection of the late Mr. W. S. Macleay.

Obs.—Baron Osten-Sacken (Ann. Mus. Genov., xvi., p. 9, 1881) points out Loew's assertion (Berl. Ent. Zeits., II., p. 106, 1858) that *Crapitula Motschulskii* occurs in the greater part of Asia and in European Russia. *Plecia melanaspis*, Wied., was first described from Java, from whence it has since been obtained by Prof. Beccari. A specimen in the Macleay collection from Nepaul cannot in my opinion be separated from this species.

II. The anterior branch of the third vein originating a long distance beyond the small cross-vein, and short and oblique.

183. *PLECIA FULVICOLLIS*, Fabricius.

P. fulvicollis, Fab., Syst. Antl. 1805; Wiedemann, Auss. Zwf., I., p. 73, 1828; *P. dorsalis*, Walker, Journ. Proc. Linn. Soc. Lond., I., p. 5, 1857; *P. amplipennis*, Sk., Proc. Linn. Soc. N.S.W., III., p. 1372, pl. xxxix., fig. 3, 1888.

I now believe my *P. amplipennis* to be the same as *P. fulvicollis*, Fab. This species has already been recorded from Sumatra, Java, Ternate, Celebes, Yule Island, and New Guinea. The specimens from which my description was taken were collected in Northern Queensland, while a few others, which seem to exhibit some scarcely important variations, came from New Hebrides and New Guinea.

186. *PLECIA DIMIDIATA*, Macquart.

P. dimidiata, Macq., Proc. Linn. Soc. N.S.W., III., p. 1377, pl. xxxix., fig. 6, ♂, 1888.

Additional localities for this species may be recorded :—Benalla, Victoria (Helms), in November; South Australia (J. G. O. Tepper), *specimens in Coll. S. Aust. Museum*; Brisbane (Dr. J. Bancroft), Ashgrove, Brisbane, and Hamilton, Upper North Pine, Queensland (C. J. Wild), *several specimens in Coll. Queensland Museum*.

The specimens from Hamilton, Upper North Pine, Q., differ in having the thorax opaque instead of nitidous, and the antennæ seem to be 2-+7-jointed, but these differences, unsupported by any others, do not appear to me to be of specific significance.

Genus *DILOPHUS*, Meigen.

Dilophus, Meig., l.c., p. 1378, pl. xxxix, figs. 7-8.

487. *DILOPHUS VARIPES*, sp.n.

♂.—Length of antennæ.....	0·015 inch	...	0·38 millimètre.
Expanse of wings	0·150 × 0·060	...	3·81 × 1·54
Size of body.....	0·180 × 0·037	...	4·56 × 0·90

Antennæ very short, black, 2-+8-jointed. Head, eyes, proboscis and palpi black. Proboscis very short. Thorax entirely black, nitidous, with two longitudinal single rows of tolerably long black hairs; two ranges of rather weak prothoracic spines. Halteres dark brown or black. Abdomen slender, black, nitidous, clothed with tolerably long black hairs. Coxæ and femora black, nitidous; tibiæ dark brown or black, testaceous at the base; fore and intermediate tarsi black, the hind pair testaceous. Fore femora a little shorter than and twice as broad as the intermediate pair, about half the length of the hind pair; the latter slender at the base, with the apical two-thirds fusiform. Fore and intermediate tibiæ short, slender, about the same length as their respective femora; hind pair long, claviform; fore. pair with three or four spines in front, immediately before the middle, and a coronet of spines at the apex. In the hind legs the first four tarsal joints enormously dilated, the first joint about as wide as the apex of the femora, the rest progressively decreasing in size. Wings shorter than the entire body, pellucid, almost hyaline, with a slightly yellowish tint, stigma prominent, brown; costal, first two longitudinal veins and cross-vein brown, the rest paler; brilliant reflections. Costal vein extending beyond the tip of the third longitudinal vein, rather less than half way from that to the tip of the anterior branch of the fork, auxiliary vein long, pale, joining the costa immediately beyond the cross-vein; sub-costal cross vein indistinct, situated opposite the base of the fork of the fifth longitudinal vein; tip of the first longitudinal vein enveloped in the stigma, disappearing before reaching the costa; middle cross-vein situated at or before the base of the fork of the fourth longitudinal vein; sixth longitudinal vein long, indistinct, not reaching the wing border.

Hab.—Mount Kosciusko, N.S.W., 5000 ft. (Helms), several ♂ specimens in March. *In Coll. Australian Museum.*

Obs.—At first sight this species appears most like *D. longirostris*, Macq., but the short rostrum will at once distinguish it.

488. *DILOPHUS LECTICOLLIS*, sp.n.

♀.—Length of antennæ.....	0·016 inch	...	0·40 millimètre.
Expanse of wings.....	0·180 × 0·070	...	4·56 × 1·77
Size of body.....	0·180 × 0·037	...	4·56 × 0·90

Antennæ very short, 2- + 9-jointed ; joints of scapus greyish ; flagellar joints black. Head, eyes, proboscis and palpi black. Proboscis short. Thorax brownish-testaceous, nitidous, with yellow hairs ; pectus and metanotum tinged with blackish ; two ranges of prothorax spines. Halteres dark brown or black, the stem yellowish. Abdomen very dark brown or black, shining, the incisions ochreous ; clothed with yellow hairs ; lamellæ of the ovipositor black. Legs testaceous, the fore tibiæ and tarsi, last three or four joints of the intermediate tarsi and last joint of the hind tarsi brown. Fore femora short, dilated, about same size as fore coxæ, half the length of hind femora ; the latter slender at the base, with the apical two-thirds fusiform. Fore and intermediate tibiæ short, of about equal length ; hind pair long, slender at the base, claviform ; the fore tibiæ with four prominent spines in front before the middle, and a coronet of the same at the apex. Tarsi slender, somewhat thicker in the hind-legs. Wings as long as the entire body, pellucid, almost hyaline ; stigma prominent, brown ; costal, first two longitudinal veins, the cross-vein and base of fourth longitudinal vein brown, the rest paler ; brilliant reflections. Costal vein extending beyond the tip of the third longitudinal vein half way from that to the tip of the anterior branch of the fork ; auxiliary vein long, yellow, joining the costa opposite the distal end of the cross-vein ; sub-costal cross-vein indistinct, situated somewhat before the base of the fork of the fifth longitudinal vein ; tip of the first longitudinal vein enveloped in the stigma, appearing to reach the costa ; middle cross-vein situated at the base of the fork of the fourth longitudinal vein ; sixth longitudinal vein long, not reaching the wing-border.

Hab.—Waterloo, Walcha, New England, N.S.W. (J. F Schofield). May.

489. *DILOPHUS DESISTENS*, Walker.

D. desistens, Walk., Trans. Ent. Soc. Lond. (n.s.), Vol. V., p. 332, 1861.

"♀.—*Nigra abdomine sub-tuberculata, pedibus testaceis, femoribus tibiis tarsisque apice nigris, coxis femoribusque anticis dilatatis, his sub-spinosis, alis albidis, venis albis, stigmata pallide fusco, halteribus testaceis.*"

"Black; abdomen tuberculated; legs testaceous; femora, tibiae and tarsi with black tips; fore coxae and fore femora dilated, the latter minutely spinose; wings whitish; veins white; stigma pale brown; halteres testaceous.

"Length of the body $1\frac{1}{4}$ lines; of the wings 3 lines.

Hab.—"New South Wales."

Obs.—This description was overlooked by me until recently; and Walker does not mention the species in his "Notes" published in 1874. The above-described does not appear, from the description, to be identical with any known species, but may possibly be the same as *D. pictipes*, Sk.

Genus *SCATOPSE*, Geoffroy.

Scatopse, Geoff., l.c., p. 1382, pl. xxxix., figs. 9-10.

189. *SCATOPSE NOTATA*, Linnæus.

Tipula notata, Linn., Faun. Suec., 1773 (1761); Fabricius, Ent. Syst., IV., 1794; *Hirta albipennis*, Fab., Suppl., 1798; *S. notata*, Meigen, Syst. Besch., I., p. 300, 1818; *S. punctata*, Meig., l.c., p. 301; *S. notata*, Zett., Ins. Lapp., 1828; Macquart, S. à B. Dipt., I., p. 181, 1834; Loew, Linn. Entom., I., p. 325, pl. iii., fig. 1, 1846; Walker, Ins. Brit., III., p. 141, 1856; *S. longipennis*, Sk., P.L.S.N.S.W., III. (Ser. 2nd), p. 1383, pl. xxxix., fig. 9, 1888.

Obs.—"I agree with you in thinking that your *Scatopse longipennis* is the same as the common European *S. notata*. I have received numerous specimens from New Zealand, which I cannot distinguish from *S. notata*. They are probably imported in ships."
—Osten-Sacken, in litt., 18th May, 1889.

190. SCATOPSE FENESTRALIS, Sk.

S. fenestralis, Sk., l.c., p. 1384, p. xxxix., fig. 10, ♀.

Originally described from N.S.W. Several specimens were recently received from Brisbane, Queensland (J. C. Wild and F. Allbon); in *Coll. Queensland Museum*.

490. SCATOPSE RICHMONDENSIS, sp.n. (Pl. xix., fig. 11.)

♀.—Length of antennæ.....	0·016 inch	...	0·40 millimètre.
Expanse of wings.....	0·080 × 0·035	...	2·02 × 0·88
Size of body.....	0·090 × 0·017	...	2·27 × 0·42

Antennæ short, 2-+8-jointed, longer than the head, black, densely covered with minute hairs. Head black, levigate, with microscopic pubescence. Eyes bronzy black. Palpi yellow. Thorax black, nitidous, densely covered with microscopic pubescence; pleuræ, pectus, scutellum and metanotum black. Halteres black. Abdomen black (the incisions pale) sub-nitidous, densely covered with minute hairs. Coxæ, femora and tibiæ black; the tarsi pale yellow. Fore coxæ and femora considerably dilated, the latter short. Wings pellucid, with a somewhat greyish tint, brilliantly iridescent; the costal and first two longitudinal veins dark brown, the rest pale. First longitudinal vein joining the costa at a point $\frac{3}{4}$ the distance from the base of the wing to the tip of the second vein; the latter joining the costa before the middle of the wing; cross-vein small; costal vein extending very slightly beyond the tip of the second vein; petiole a little arcuated at the base, considerably shorter than the posterior branch of the fork; anterior branch bent anteriorly at the tip, reaching the margin before the apex of the wing; posterior branch not reaching the margin; base of the fork situated a little beyond the middle of the wing; wing-fold and following vein almost straight and parallel, not reaching the margin; the last longitudinal vein strongly bisinuate, also not reaching the margin.

Hab.—Richmond River, N.S.W. (Helms). March and April.

EXPLANATION OF PLATE.

PLATE XIX.

- Fig. 1. Wing of *Lygistorrhina insignis* (♀).
Fig. 2. Head of *Lygistorrhina insignis* (viewed from above); with mouth-
parts displayed.
Fig. 3. Wing of *Sciophila Richmondensis*.
Fig. 4. „ *Neoempheria signifera*.
Fig. 5. „ *Stenophragma picticornis*.
Fig. 6. „ *Clastobasis Tryoni*.
Fig. 7. „ *Delopsis flavipennis*.
Fig. 8. „ *Dynatosoma Sydneyensis*.
Fig. 9. „ *Brachydicrania fascipennis*.
Fig. 10. „ *Synplasta annuliventris*.
Fig. 11. „ *Scatopse Richmondensis*.

STUDIES IN AUSTRALIAN ENTOMOLOGY.

No. IV.—NEW GENERA AND SPECIES OF CARABIDÆ.

BY THOMAS G. SLOANE.

EURYSCAPHUS EBENINUS, n.sp.

Black, shining. Head subquadrate (7×9 mm.); frontal sulci parallel towards the front then curving sharply out towards the base of the mandibles, a curved impression connecting them behind; the space between the sulci and antennæ slightly rugulose; eyes not prominent, a short blunt process projecting forward below each; a single supra-orbital puncture on each side. Prothorax transverse (8×13 mm.), not convex, widest behind the middle; sides slightly rounded, and a little narrowed to the front; anterior angles obtuse, strongly produced, posterior angles rounded, not marked; anterior margin sinuate; base distinctly lobate; lateral border strongly reflexed, wider on each side behind, narrow on the basal lobe; median line distinct, ending behind in a strong transverse impression defining the basal part; two marginal punctures on each side as usual in the genus. Elytra subcircular (17×16 mm.), convex, smooth (some faint traces of striæ towards the apex), broadest before the middle, rounded on the sides; humeral angles rounded, with the margin very strongly reflexed; lateral margins broad, not reflexed behind but strongly so in front; a single puncture on the apical third of each elytron. Anterior tibiæ with two strong teeth externally, and above these three small projections.

Length 34, breadth 16 mm.

Hab.—Yilgarn, West Australia, 200 miles north-east of York, W.A.

I am indebted to Mr. C. French, Government Entomologist of Victoria for my single specimen of this fine species.

The bipunctate elytra place this species with *E. bipunctatus*, MacI., *E. obesus*, MacI., and *E. tatei*, Blackb. In general appearance it resembles *E. bipunctatus*, from which however the lobate prothorax will sufficiently distinguish it; from *E. obesus* it may be distinguished by the prothorax being decidedly lobate, and broadly margined laterally, by the elytra being proportionately broader, less convex, more broadly and decidedly emarginate at the base, the lateral margins broader and far more conspicuous, especially at the shoulders. *E. tatei* is unknown to me, but judging from the description it is more closely allied to *E. obesus* than to the present species.*

HELLUO INSIGNIS, n.sp.

Black. General form depressed. Head large, flat (as in *H. costatus*). Prothorax glabrous, corvate (5 x 6 mm.), widest about anterior third, rugulose, punctate; the punctures large, thickly placed along margins, thinly in middle; lateral border narrow, reflexed, sharply sinuate behind and meeting the base squarely; base broadly emarginate in middle and cut obliquely forward on each side to the posterior angles, these prominent; a transverse impression in front; median line clearly and distinctly impressed. Elytra glabrous, broadly ovate (13 x 10 mm.), widest behind the middle; sides lightly rounded; shoulders rounded; apex broad, truncate; 4 costae on each elytron (including suture), between every costa a smooth shining interstice, between every costa and interstice a strong punctate stria, every costa with two rows of thinly

* I take the present opportunity to make the following notes on three New South Wales species of *Euryscaphus* known to me:

- (1) *E. bipunctatus*, MacI. - I have taken this species at Mulwala on the Murray, and at Condobolin on the Lachlan.
- (2) *E. obesus*, MacI. - *E. ferox*, Sloane, P.L.S.N.S.W., 1888 (2), Vol. III, p. 1109 - this I have ascertained by comparison of the types: when I wrote I only knew *E. obesus* from description. The faint puncturation of the elytra noted in my description is not natural. The habitat of *E. obesus* is therefore western New South Wales, not West Australia as believed by Sir W. Macleay.
- (3) *E. minor*, MacI. *E. archarius*, Sloane, l.c., p. 1110 - also from comparison with type. This is a widely spread species in N.S.W.; I have taken it at Mulwala, Condobolin, and at Coonabarabran on the Castlereagh.

placed fine punctures, one on each side; the space between the outer costa and lateral margin thickly set with coarse punctures in rows (about five rows). Prosternum punctate, the episterna smooth, shining. Mesosternum, metasternum, coxæ and trochanters punctate. Segments of abdomen shining, thinly punctate in middle, the sides and apex thickly set with fine setigerous punctures; apex of abdomen projecting beyond elytra.

Length 23-28, breadth 8-10½ mm.

Hab.—Darling River, N.S.W.

This fine species is very distinct from *H. costatus*, being a larger and much broader insect; it can be distinguished at once by its broader and less parallel elytra much more coarsely punctate and without any reddish hairs along the striæ. The episterna of the prothorax too are smooth, while in *H. costatus* they are punctate.

This species was first sent from Walgett by Mr. Rose last April; since then Mr. R. Helms, when collecting in June on the Darling for the Australian Museum during the disastrous Darling floods, got about 1500 specimens along that river between Bourke and Wilcannia.

CASNONIA RIVERINÆ, n.sp.

Head black, globular, constricted behind, united to the prothorax by a condyle, covered with scattered erect hairs; eyes prominent; antennæ black, 2nd joint short, 3rd and 4th cylindrical, about equal in length, hardly longer than succeeding joints, these rather depressed. Prothorax red, excepting the basal portion bluish black, globular, about as long as broad ($1\frac{1}{4} \times 1\frac{1}{4}$ mm.), basal part constricted, anterior part with scattered erect hairs; a lateral ridge on each side; the median line visible, not impressed. Elytra bluish green with a single broad reddish fascia on the apical half, (the fascia arcuate behind and not reaching the sides of the elytra), short, broad, about twice as broad as prothorax ($3\frac{1}{2} \times 2\frac{1}{2}$ mm); base subtruncate, declivous, the shoulders rounded; apex broad, subsinuate, obliquely cut on each side to the tip; basal third and sides strongly punctato-striate; apex punctato-rugulose; 4 equidistant rows of erect sparsely placed hairs extending

the whole length of the elytra, all crossing the elytral fascia. Undersurface bluish black, excepting the prothorax in front of the coxae red, and the metasternum piceous. Legs black, the basal part of the femora light yellow; tarsi hairy above, last joint not bifid.

Length 7, breadth $2\frac{1}{2}$ mm.

Hab.—Mulwala, Murray River, N.S.W.

This species is closely related to *C. globulicollis*, MacL., though very distinct by the markings of the elytra. As pointed out by Sir William Macleay, these species evidently cannot remain in the same genus as *C. aliena*,* Pasc.; they differ from it in their short globular prothorax, broader elytra, hairy tarsi, and the form of the antennae. In *C. aliena* the antennae are very slender and have the 3rd joint about equal in length to the 3 succeeding ones, while *C. riverinae* and *C. globulicollis* have the 3rd joint much shorter and about as long as the 4th. De Chaudoir has expressed the opinion (Bull. Mosc. LII, 1877, p. 265) that *C. obscura* would be better placed in *Odacantha*, a genus unknown to me except from description.

LACCOCENUS, n.gen.

Head not large, with a longitudinal ridge on each side extending backwards as far as the base of the eyes, forehead smooth, two supra-orbital punctures on each side.

Mandibles, short, strong, scrobe with a setigerous puncture in front.

Maxillae roundly curved in front, apex elongate, not acute, inner side clothed with a single row of hairs.

Labrum sexsetose and lightly emarginate in front.

Clypeus emarginate, a strong setigerous puncture on each side.

* De Chaudoir has published the identity of *C. australis*, Chaud., and *C. clarensii*, Cast., with *C. aliena*, Pasc. (Bull. Mosc. XLV, Part 1, 1872, p. 405); to these must be added *C. angusticollis*, MacL., that species being (as suspected by its author) not separable from *C. aliena*, thus I have ascertained by comparison of a specimen of *C. aliena* from the Richmond River, N.S.W., in my collection with Sir William Macleay's type of *C. angusticollis*.

Labium short, bisetose, lightly emarginate in front.

Mentum deeply emarginate, with a short bifid median projection ; lobes rounded externally, oblique on inner side.

Palpi short, thick, cylindrical ; labial having last joint equal in length to penultimate, obtuse at apex, penultimate joint bisetose in front and with a short seta at the apex externally ; maxillary having penultimate joint short, triangular, last joint with the apex a little narrowed and obtuse.

Antennæ short, moniliform, incrassate, 3 basal joints cylindrical, others flattened and ciliate on each edge, 1st joint thick, 2nd shortest, 3rd longer, about equalling 1st in length, others equal.

Prothorax about as wide as long, sides rounded and plurisetose in front, sinuate behind, disc canaliculate, a single strong lateral impression on each side behind, posterior marginal seta at the basal angle.

Elytra oval, convex, punctato-striate, without a basal border.

Prosternum setigero-punctate, particularly towards the front.

Mesosternal episterna punctate, the epimera not reaching the coxæ.

Metasternum strongly punctate on each side, the episterna narrow, elongate.

Ventral segments with transverse rows of strong punctures on each side, these more thickly placed on the basal segments.

Legs : anterior femora short, thick, lightly channelled below on apical half ; anterior tibiæ straight, narrow, lightly excavate below, apical portion hirsute on lower side ; tarsi short, narrow, last joint longest, (much longer in posterior tarsi), other joints quadrate, 3 basal joints in male slightly dilatate and clothed with spongiöse tissue below.

Body pedunculate, winged.

Scutellum small, placed on the peduncle.

The position of this genus among the Australian *Carabidæ* appears doubtful ; in most characters it approaches the *Morionini*, and but for the scrobe of the mandibles having a setigerous puncture I should place it in that subfamily. Probably its nearest

relationship is to the genera *Moriomorpha* and *Melasodera*; (de Castelnau's genus *Celanida* is synonymous with *Melasodera*). I am inclined to suggest a new subfamily *Moriomorphini* to include the three genera. The short incrassate moniliform antennæ, and the mandibles with a setigerous puncture in the scrobe are characteristic features of all three genera.

LAOCOENUS AMBIGUUS, n.sp.

Black, shining; legs and parts of mouth piceous. Head smooth, elongate; a longitudinal ridge on each side, extending from outer angles of clypeus to base of eyes, preocular ridges rounded inwards in front to meet these facial ridges at base of clypeus; a transverse impression across the head behind the eyes; eyes prominent, inclosed behind; anterior supra-orbital puncture conspicuous, placed between the ridges level with the front of the eyes. Prothorax smooth, slightly broader than long, ($1\frac{1}{2} \times 1\frac{1}{4}$ mm.), widest about anterior third, not much narrowed at base, truncate in front and behind; sides rounded in front, sinuate behind and meeting the base at right angles; anterior angles round, not advanced; lateral border strongly reflexed, lateral channel with long setæ, except on straightened part behind; median line distinctly impressed on disc, not reaching either margin; a short deep longitudinal impression on each side at the base, a narrow ridge separating this impression from the lateral channel. Elytra oval ($3\frac{3}{4} \times 2$ mm.), convex, parallel on sides, truncate at base, rounded at apex, striate on disc; sides smooth; 4 striæ formed by closely placed strong punctures on the sutural half of each elytron, these striæ not reaching the base or apex; lateral border strong, reaching peduncle in front, not reaching to tip of elytra; a few umbilical punctures along the margin, these interrupted in the middle; two small punctures at base of each elytron. Ventral segments glabrous, strongly divided, a transverse row of punctures at base of each segment.

Length $6\frac{1}{2}$, breadth $3\frac{3}{4}$ mm.

Hab.—Dunoon, Richmond River (R. Helms).

The following species should not, I think, be separated from the Australian Carabs referred to the genus *Drimostoma* by de Castelnau in his work on Australian Carabidæ.* It however presents some very decided differences; the most noticeable being its greater size, and the form of the antennæ and mentum. In *D. helmsi* the antennæ are moniliform and slightly thicker to the apex; while in a species from Victoria in my collection, which I regard as *D. australis*, Casteln., the antennæ are filiform and slender; the mentum in *D. helmsi* is short, with the lobes rounded on the outer side, obtuse at the apex, and broadly oblique on the inner side; in *D. australis* (?) the mentum has the lobes triangular and pointed at the apex, the inner and outer sides being sharply and about equally oblique; the median tooth does not present any differences. Both species seem to agree in all other points and both have the scrobe of the mandibles furnished with a setigerous puncture in front.

DRIMOSTOMA HELMSI, n.sp.

Black; legs, palpi, and antennæ piceous. Head small; forehead with a straight strong longitudinal groove on each side; the clypeal suture distinct between the grooves; clypeus large, declivous, truncate in front, the lateral setigerous punctures strongly marked; neck short, globular, slightly raised above the plane of the forehead; eyes prominent, hardly inclosed behind, but strongly inclosed below; two supra-orbital punctures on each side. Labrum sex-setose, truncate. Mandibles short, strong, curved and acute at apex; scrobe with a setigerous puncture in front. Mentum short, obliquely emarginate; lobes obtuse at the apex, rounded externally; median tooth short, broad, triangular, a rounded suture dividing it from the mentum. Palpi short; maxillary having penultimate joint narrow, triangular, last joint elongate (longer than penultimate), narrowed and subacute at apex; labial having last joint rather longer than penultimate, thick, club-shaped, the apex obtuse. Antennæ short, moniliform, slightly incrassate; 4 basal joints cylindrical, others subquadrate, compressed,

* Trans. Roy. Soc. Victoria, 1868, VIII., p. 198.

3 basal joints glabrous, 1st thick, 2nd very short, 3rd nearly twice the length of 2nd. Prothorax short, broad ($2\frac{1}{2} \times 3$ mm.), not convex, truncate behind, broadest about the middle; the sides strongly rounded; anterior angles rounded; basal angles prominent, subdentiform; border rather strongly and equally reflexed, very shortly sinuate in front to basal angles, extending along anterior margin on each side, but not crossing the middle, fine, but entire, on the base; median line lightly marked; a wide irregular impression on each side of the base; two marginal setæ on each side, the anterior one at the broadest part, the posterior one on the border at the basal angles. Elytra broadly oval ($5 \times 3\frac{1}{2}$ mm.), subconvex, declivous behind, vertical on the sides, strongly striate; dorsal interstices equal, convex; striæ crenulate, 1-6 on dorsal surface, 7th obsolete, 8th (the marginal stria) strongly punctate along its course; the space (about the width of 2 interstices) between the 6th and 7th striæ smooth and vertical on the sides, becoming carinate behind, and reaching the apex; base truncate, declivous, appearing slightly emarginate between the shoulders, the basal border sinuate behind and terminating in a short tooth at the shoulders; lateral border reflexed, more widely so in front, sinuate behind. Scutellum small, triangular; no abbreviated subscutellar stria. Prosternum not excavated between the coxæ; metasternal epimera not reaching the coxæ. Ventral segments levigate, 3 last convex, deeply divided from one another. Tarsi short; the joints slightly dilatate in the male, but not spongiose below; posterior coxæ contiguous.

Length 9, breadth $3\frac{1}{2}$ mm.

Hab.—Dunoon, Richmond River (R. Helms, April, 1890.)

In the present state of our knowledge of the Australian *Feronini* a new genus is needful for a large *Feronid* in the Australian Museum, labelled "Wide Bay Queensland." It will come between *Nurus* and *Mecynognathus*, as represented by *Homalosoma dilaticeps*, Chaud. I would here note that I am not at all sure that *Homalosoma dilaticeps*, Chaud., is congeneric with *Mecynognathus*

damelli, Macl., though both Gestro and de Chaudoir have agreed in regarding it as so. The present species has the fascies of a *Nurus*, but can readily be distinguished by the want of a basal border to the elytra, and absence of squamulæ on the lower surface of any of the joints of the anterior tarsi in the ♂.

NURIDIUS, n.gen.

Head large, with strong frontal impressions, the sides not protuberant behind the eyes; two supra-orbital punctures on each side; eyes convex.

Labrum sexsetose, broad, rounded in front.

Palpi as in *Homalosoma*; penultimate joint of labial palpi with 5 long-setæ in front, and two short setæ (one at each side) near the apex.

Mentum, *clypeus*, *mandibles*, and *antennæ* not differing from *Homalosoma*.

Prothorax subquadrate, transverse, a little narrowed behind; a flattened space along the base between the lateral basal impressions; basal angles rounded; posterior marginal puncture placed within the lateral margin.

Elytra subcostate, convex, broad, not narrowed behind; apex broadly rounded, not sinuate; base without a border; shoulders subdentiform.

Body apterous, subpedunculate.

Prosternum and *mesosternum* setigero-punctate.

Metasternal episterna broader than long.

Legs: anterior femora with a row of setigerous punctures in front, extending to near apex; anterior tarsi in ♂ hardly dilatate and without squamulæ below, basal joint as long as two succeeding joints taken together; posterior trochanters short, obtusely rounded at apex.

NURIDIUS FORTIS, n.sp.

Black, shining, the elytra a little opaque; elytra without a basal border; body subpedunculate.

♂. Head large (7×7 mm.), slightly ampliate behind the eyes; frontal impressions strong, subsinuate; labrum rounded; clypeus very lightly emarginate, clypeal suture distinct; eyes round, projecting. Prothorax short, transverse (6×9 mm.), a little narrowed behind, not convex, declivous to the anterior margins, and behind in the middle; anterior margin slightly sinuate; base broadly emarginate in the middle; lateral borders thick, reflexed, wider at the anterior angles, more strongly reflexed behind; the basal angles rounded; the posterior marginal seta placed inside the margin at the angles of the base; a strong transverse impression in front; a flattened space along the middle of the base, connected by an oblique transverse impression with the lateral channel on each side; median line strongly impressed, crossed by fine transverse striolæ. Elytra short, broad (16×12 mm.), convex, declivous and broadly rounded behind (not sinuate), subtruncate at base, lightly rounded on the sides, broadest behind the middle, striate; the striae very lightly punctate; the interstices subcostate, (not carinate), equal, 1st, 2nd, and 6th reaching the apex, all except the 7th obsolete at base; two fine punctures on 3rd interstice towards the base; no abbreviated stria behind the scutellum; lateral borders reflexed, rising from a short subdentiform projection at the shoulders, reaching the apex; a narrow shining margin along the sides, punctate on its inner edge. Scutellum short, broad, rounded behind. Prosternum longitudinally impressed between the coxæ, setigero-punctate, a few scattered setigerous punctures towards the middle, in front of the coxæ. Mesosternum setigero-punctate. Metasternum not punctate on each side near the epimera; the episterna short, margined behind and on inner side, declivous to the epimera. Segments of abdomen, except the last, with scattered setigerous punctures towards the middle, last segment with one setigerous puncture on each side.

♀. -Rather narrower; head $6 \times 6\frac{1}{2}$, prothorax $6 \times 8\frac{1}{2}$, elytra $16 \times 11\frac{3}{4}$ mm.

Length 31, breadth $11\frac{3}{4}$ -12 mm.

Hab.—Wide Bay District, Queensland.

Loxogmus, n.gen.

Head short, broad; eyes round, very prominent; forehead strongly bi-impressed.

Mandibles short, broad; external edge arcuate; apex hooked, acuminate.

Labrum small; the anterior margin truncate, setigerous; (it is declivous in front from behind the setæ, and this causes the anterior margin to appear lightly emarginate from some points of view.)

Clypeus smooth, transverse, declivous, truncate in front; clypeal suture distinct.

Mentum short, obliquely emarginate; median tooth short, a raised suture across its base.

Palpi short, thick; labial having the two apical joints equal in length, penultimate bisetose in front, last very thick, wide, and truncate at apex; maxillary having penultimate joint very short, triangular, apical joint about twice the length of penultimate, thick, cylindrical, truncate.

Antennæ short, subfiliform, rather thicker towards apex, 3 basal joints glabrous, 1st thick, longest, 2nd short, 3rd longer than 2nd or subsequent joints.

Legs: thighs short, thick, anterior thickest, channelled below; anterior tibiæ rather arched, wide and truncate at apex, emargination of lower side deep; 4 posterior tarsi with the joints sulcate externally, anterior tarsi in ♂ with the joints triangular, 3 first dilatate, clothed with two oblique rows of pulvilli below, 4th small, without pulvilli below.

Prothorax transverse, not narrowed behind; sides rounded in front; basal angles squarely marked; median line light; an elongate impression on each side behind, reaching the base; the posterior marginal puncture at the base considerably distant internally from the lateral margin.

Elytra striate, the 5th stria bent obliquely inwards towards the base; the base bordered, the border ending in a tooth at the shoulders; no abbreviated subscutellar stria.

Prosternum not excavate between the coxae, not margined behind. *Metasternal episterna* and *epimera* short though together longer than front margin of *episterna*. *Sterna* smooth.

Ventral segments crossed by transverse sulci, smooth; the punctures of the ambulatorial setae present, these large and foveiform on apical segment.

Body not pedunculate, apterous.

This form is a very distinct one among the Australian *Feronini*. It appears to have some affinity to *Microferonia*, Blackburn, a genus I have never seen; but the shape of the palpi and the sulcate ventral segments are sufficient in themselves to prevent its coming into that genus. Its place seems to be in the series of genera of which *Ceneus* may be taken as the central genus; these are characterised by their sulcate ventral segments, and maxillary palpi with the penultimate joint triangular and shorter than the last. The single impression on each side of the prothorax behind will readily distinguish it from *Ceneus*, &c.

Loxogmus obscurus, n.sp.

♂.—Black, shining; antennae, tarsi, and parts of mouth piceous. Head smooth, short, strongly impressed on each side; the space on each side between the eyes and frontal impression forming a ridge; clypeal suture strongly marked; a transverse impression across the head behind the eyes; eyes prominent. Prothorax smooth, depressed, broader than long (3 × 4 mm.), not narrowed behind; sides parallel behind, rounded in front; anterior angles not produced; posterior angles rectangular; anterior margin broadly emarginate, bordered on each side; base truncate, the middle very lightly emarginate; lateral margin narrow, reflexed; median line lightly marked, not reaching either margin; a single narrow longitudinal impression at the base on each side about half way between median line and margin. *Elytra* broad (6½ × 4 mm.).

truncate at base, parallel on the sides, lightly sinuate at apex, strongly striate; the striæ extending in full depth to base and apex, 2nd rising from a punctiform impression at base, 5th bent inwards near the base; interstices subconvex, 3rd impunctate, 8th punctate, the punctures most thickly placed near the shoulder, interrupted in the middle; basal border ending externally in a sharp tooth at shoulders. Ventral segments sulcate, strongly divided; apical segment with two strong foveiform impressions behind the middle. Metasternal episterna and epimera short, though together longer than anterior margin of episterna. Legs short; anterior femora wide at apex.

Length $11\frac{1}{2}$, breadth $4\frac{1}{2}$ mm.

Hab.—Dunoon, Richmond River, N.S.W. (R. Helms). A single specimen in my collection.

NOTES AND EXHIBITS.

Mr. Froggatt read the following Note on the life-history of *Pterygophorus cinctus*, Klug:—"Though this and *P. interruptus* are two of our commonest saw-flies in the bush round Sydney, I can find no notice of anything having been recorded about their larval stages. Having recently bred some from larvæ obtained in this neighbourhood, I hope the following note may be of some interest to entomologists. The larva of this saw-fly is of a dull greenish colour, the head black, the thoracic segments broad, the remaining segments tapering to a point, with the anal segment prolonged into a long slender tail-like appendage curved over the back when feeding; all the segments are covered with small black tubercles which are thickest on the basal ones. They vary much in colour from pale yellow to very dark green consequent on their frequent moulting. They feed on the leaves of *Leptospermum* in April and May, and, unlike the larvæ of *Perga*, do not form social clusters, but are scattered; they feed during the day, and trust to their colour and remarkable resemblance to the twigs to which they cling to escape detection. Some larvæ taken at the end of April at Rose Bay were placed in a jar; they showed no signs of going into the soil at the bottom like those of *Perga*, but the following week were noticed boring holes into the cork covering the jar. Upon placing some pieces of dead wood in the jar they betook themselves to these and soon all of them had disappeared, closing the entrance of their tunnels with the wood they excavated in forming the chambers. On examining the wood three months afterwards I found that they made no cocoons, but the sides of the chambers occupied were black and shining; the larva itself had become much shorter, and the anal tail had disappeared. The first perfect saw-flies came out in the first week of September, and I have now a number of the larvæ of this, and of what I believe to be two other species of this genus which feed upon the leaves of *Eucalyptus*, in various stages of transformation.

The Rev. Dr. Woolls sent specimens of *Calotis scapigera* and *C. hispidula* for exhibition, accompanying the following note:—
“I have lately found growing by the roadside at Concord, but probably conveyed accidentally from the interior, a plant of *C. scapigera*, Hook. This species was collected by the late Sir T. Mitchell, and described in a note at p. 75 of his “Tropical Australia.” It is common to N. and S. Australia, Victoria, Queensland, and N. S. Wales, but until recently it has not been found in this colony on the eastern side of the Dividing Range, being limited, as hitherto recorded, to the vicinity of the Lachlan, Macquarie, and Darling. The flowers of *C. scapigera* are yellow in the centre, and white or lilac in the ray, having a pretty daisy-like appearance, and the roots are creeping and stoloniferous. The species occurring near Sydney are *C. dentex*, R. Br., *C. cuneifolia*, R. Br., both with the ray florets purple, and *C. lappulacea*, Benth., with yellow flowers. Not long since I found *C. hispidula*, F.v.M., growing on a heap of manure near Burwood, but in this case it is probable that the plant sprang from seeds brought by sheep from the interior, as the burrs adhere to the wool and are very troublesome in some parts of the colony. It may be mentioned that the genus *Calotis* is limited to Australia, and that the species now known are the 15 described in the *Flora Australiensis*, and another (*C. Kempei*) in Baron Mueller’s Census. Of these 13 occur in N. S. Wales, and only four in W. Australia. *C. cymbacantha* (F.v.M.), common to S. Australia, Victoria, and N. S. Wales, is elegantly figured amongst the Baron’s Lithograms of Victorian Plants.”

Mr. Fletcher exhibited specimens of the frog described by Mr. Boulenger.

Mr. Skuse showed examples of *Batrachomyia*, a fly which in the larval state is parasitic upon frogs; and he remarked that though he was familiar with the perfect insects when bred from frogs, these were the first specimens met with on the wing which had come under his notice; they were caught in a marshy place at Thornleigh, near Sydney.

Mr. Deane exhibited for Mr. J. F. Fitzhardinge a remarkable example of fasciation in a branch of *Casuarina* from Deep Water, New England, forwarded by Mr. A. T. Wood.

Mr. John Mitchell communicated a preliminary note recording the occurrence of some new Entomostraca of the genera *Beurichia*, *Primitia*, and probably *Bairdia*, in the Bowring Shales.

Dr. Cox called attention to the general exactness of the time of appearance (about the 24th of October) of the Cicada in the neighbourhood of Sydney; and he asked members to note the dates in instances coming under notice during the ensuing month.

WEDNESDAY, 29TH OCTOBER, 1890.

The President, Professor Stephens, M.A., F.G.S., in the Chair.

DONATIONS.

"Transactions of the Royal Society of Edinburgh." Vol. XXXIII., Part 3; XXXV. (Sessions 1886-87, 1889-90); "Proceedings." Vols. XV. & XVI. (Sessions 1887-88 & 1888-89). *From the Society.*

"Journal of the Linnean Society of London.—Botany." Vols. XXV., Nos. 171 & 172; XXVI., No. 174; XXVII., Nos. 181 and 182 (1888-89); "Zoology." Vols. XX., Nos. 122 & 123; XXI., Nos. 133-135; XXIII., Nos. 141-144 (1888-89); "List of Members, Jan., 1890;" "Proceedings," Nov., 1887-June, 1888. *From the Society.*

"Royal Dublin Society.—Scientific Transactions." Series ii., Vol. III., Parts 11-13 (1886-87); "Scientific Proceedings." n.s. Vol. V., Parts 3-6 (1886-87). *From the Society.*

"The Australasian Journal of Pharmacy." Vol. V., No. 57 (September, 1890). *From the Editor.*

"The Perak Government Gazette." Vol. III., Nos. 24-26 (August & September, 1890). *From the Government Secretary.*

"Elfter Bericht des Botanischen Vereines in Landshut (Bayern) über die Vereinsjahre 1888-1889." *From the Society.*

"Department of Mines, Sydney: Memoirs of the Geological Survey of New South Wales; Palæontology, No. 8.—Contributions to a Catalogue of Works, Reports and Papers on the Anthropology, Ethnology, and Geological History of the Australian and Tasmanian Aborigines." Part I. By R. Etheridge, Junior. *From the Minister for Mines.*

"Zoologischer Anzeiger." XIII. Jahrg., Nos. 342-344 (1890).
From the Editor.

"Mittheilungen aus der Zoologischen Station zu Neapel." IX. Bd., Heft 3 (1890). *From the Zoological Station.*

"Mémoires de la Société Zoologique de France pour l'Année 1890." Tome III., Parts 2 & 3; "Bulletin pour l'Année 1890." Tome XV., No. 6 (June). *From the Society.*

"Feuille des Jeunes Naturalistes." No. 239 (Sept., 1890);
"Catalogue de la Bibliothèque." Fasc. No. 9 (1890). *From the Editor.*

"Archiv für Naturgeschichte." LIV. Jahrg., Band II., Heft 1. (1888). *From the Editor.*

"The Journal of Conchology." Vol. VI., No. 7 (July, 1890).
From the Conchological Society of Great Britain and Ireland.

"Mittheilungen der Naturforschenden Gesellschaft in Bern aus dem Jahre 1889;" "Archives des Sciences Physiques et Naturelles, Oct.-Nov., 1889.—Compte Rendu des Travaux présentés à la Soixante-Douzième Session de la Société Helvétique des Sciences Naturelles réunie à Lugano, Sept., 1889;" "Atti della Società Elvetica delle Scienze Naturali adunata in Lugano, Sept., 1889." 72ª Sessione (1888-89). *From the Natural History Society of Bern.*

"Records of the Geological Survey of India." Vol. XXIII. Part 3 (1890). *From the Director.*

"Results of Meteorological Observations made in N.S.W. during 1888;" "Results of Rain, River and Evaporation Observations made in N.S.W. during 1889." By H. C. Russell, B.A., C.M.G., F.R.S., &c., Government Astronomer. *From the Author.*

"Bulletin de la Société Impériale des Naturalistes de Moscou." Année 1890, No. 1. *From the Society.*

"Fifth and Sixth Annual Reports of the Bureau of Ethnology, Washington." 1883-84 and 1884-85. By J. W. Powell, Director; Five Bulletins. *From the Director.*

"Bulletin de la Société Royale de Géographie d'Anvers." Tome XIV., Fasc. 3 (1890). *From the Society.*

"Journal of the Royal Microscopical Society, London, 1890." Part 4. *From the Society.*

"Proceedings of the Academy of Natural Sciences of Philadelphia, 1889." Part III. *From the Academy.*

"Proceedings of the California Academy of Sciences." 2nd Series. Vol. II. (1889). *From the Academy.*

"Bulletin of the American Museum of Natural History." Vol. II., Nos. 3 & 4 (1889-90). *From the Museum.*

"Annals of the New York Academy of Sciences." Vol. V., Nos. 1-3 (1889); "Transactions." Vol. IX., Nos. 1 & 2 (1889). *From the Academy.*

"The Journal of the Cincinnati Society of Natural History." Vol. XII., No 4 (1889). *From the Society.*

"Journal of the Elisha Mitchell Scientific Society." Vol. VI. Part 2 (1889). *From the Society.*

"Mémoires de l'Académie Impériale des Sciences de St. Pétersbourg." vii.^e Série. Tome XXXVII., Nos. 3-5 (1889-90). *From the Academy.*

"Annales de la Société Belge de Microscopie." Tome XII. (1885-86). *From the Society.*

"Australian Museum, Sydney; Catalogue, No. 12.—Descriptive Catalogue of the Nests and Eggs of Birds found breeding in Australia and Tasmania." By A. J. North, F.L.S.; "Report of Trustees for the year 1889;" "Records." Vol. I., No. 4 (September, 1890). *From the Trustees.*

"Verhandlungen der k.k. zoologisch-botanischen Gesellschaft in Wien." XXXIX. Band, Parts 3 & 4 (1889). *From the Society.*

"The American Naturalist." Vol. XXIV., No. 284 (August, 1890). *From the Editors.*

"Proceedings of the United States National Museum, Washington." Vols. XI. (1888), Sheets 34 & 35; XIII. (1890), Nos. 794, 799-812; "Bulletin." No. 38 (1890). *From the Museum.*

"The Journal of Comparative Medicine and Veterinary Archives." Vol. XI., No. 9 (September, 1890). *From the Editor.*

"Department of Agriculture, Melbourne.—Bulletin." No. 9 (1890). *From the Secretary of Agriculture.*

"The Victorian Naturalist." Vol. VII., No. 6 (October, 1890). *From the Field Naturalists' Club of Victoria.*

Pamphlet entitled "Fodder Plants and Grasses of Australia." By Fred. Turner, F.R.H.S., Lon. *From the Author.*

Two Pamphlets entitled "On the Gum of the Leopard Tree" (*Flindersia maculosa*, F.v.M.); "Observations on the Gums yielded by two species of *Ceratopetalum*." By J. H. Maiden, F.L.S., &c. *From the Author.*

"The Australasian Critic." Vol. I., No. 1 (October, 1890). *From the Manager.*

"Comptes Rendus des Séances de l'Académie des Sciences, Paris." Tome CX. (26 Nos.); CXI., Nos. 1-6 (1890). *From the Academy.*

"Proceedings of the Zoological Society of London for the year 1890." Part II. *From the Society.*

"Zeitschrift der Gesellschaft für Erdkunde zu Berlin." Band XXV., Heft 3 (1890); "Verhandlungen." Band XVII., No. 6 (1890). *From the Society.*

"Bollettino dei Musei di Zoologia ed Anatomia comparata della R. Università di Torino." Vol. V., Nos. 74-86 (1890); with two plates. *From the Museum.*

"Tenth and Final Report of the Committee of Management of the Technological, Industrial and Sanitary Museum of N.S.W., for 1889" *From the Curator.*

PAPERS READ.

JOTTINGS FROM THE BIOLOGICAL LABORATORY
OF SYDNEY UNIVERSITY.

BY WILLIAM A. HASWELL, M.A., D.Sc., EDIN.,
CHALLIS PROFESSOR OF BIOLOGY, UNIVERSITY OF SYDNEY.

14. ON A REMARKABLE FLAT-WORM PARASITIC IN THE
GOLDEN FROG.

(PLATE XX.)

It is several years since my attention was first directed to a remarkable worm living as a parasite in the common gold-and-green frog (*Hyla aurea*); but, though specimens have been met with several times since in the frogs dissected in the laboratory, I have rarely had the opportunity of examining them before they had been to some extent broken or destroyed. Altogether I think six or seven cases of frogs infested with the parasite in question have been met with during the last three years out of at least 150 specimens dissected; so that this parasite, though not uncommon, is by no means so general in its occurrence in this species of frog as *Rhabdonema*, *Distoma* or *Myxosporidium*, all of which are to be found in nearly every individual carefully examined for them.

The worm at present under consideration occurs sometimes in the subdermal lymph-sinuses—in some cases on the ventral, in others on the dorsal side—or it is found between the superficial muscles of the thigh or the leg, or (this I observed only in one instance) in the pleuro-peritoneal cavity.

It has the form and appearance of a long and narrow, transversely ribbed white ribbon. The longest specimen—which still had the appearance of being incomplete behind—was about two inches in length when moderately extended, and about a tenth of an inch in greatest breadth. Uninjured specimens showed incessant and active movements. These consisted of alternate elongations and contractions of the body which were most marked at the

anterior end; this extremity would be pushed out with great rapidity and the whole of the anterior part of the body would become stretched and narrow ending in front in a point. Then the anterior end would be drawn back and that part of the body greatly contracted and thickened—the extreme anterior end sometimes becoming involuted within the part immediately following it.

The body is divided into a number of narrow segments which are very sharply defined in front, except when the body is stretched to its utmost, but becomes less marked behind. These are not all perfectly regular, but their length is in general less than a third of the breadth of the body. A well-marked notch, most distinct when the animal is contracted, is found at the anterior end. On no part of the body is there any opening to be found, and there is no vestige of hooks or suckers.

At first I was greatly puzzled as to the relationships of this remarkable parasite, but an examination of sections showed at once that I had to do with one of the so-called "parenchymatous" worms; and the absence of an alimentary canal proved that it was among the Cestodes and not among the Trematodes that I had to look for its nearest relatives. That it must be a scolex was evident from the situation in which it was found, as well as from the absence of reproductive organs.

Only three genera of the Cestodes are known to have solid, elongated scolices, viz., *Tetrarhynchus*, *Schistocephalus* and *Ligula*. The movements of the anterior end of the scolex of *Tetrarhynchus gigas* from the muscles of *Orthogoriscus mola* as described by Van Beneden resemble closely those of the parasite of Hyla—"Cette partie du corps s'étend, se raccourcit, s'étrangle, se recourbe, tantôt à droite, tantôt à gauche, et semble chercher avec anxiété un tissu à perforer."* But the form is cylindrical, or nearly so, and there is an entire absence of segmentation.

* "Sur les vers parasites du poisson-lune (*Orthogoriscus mola*) et le *Cerops Latreille* qui vit sur ses branchies" Bulletin de l'Académie Royale de Belgique, Tome XXII

The scolices of *Schistocephalus* and *Ligula*, then, would seem to be the nearest known allies of the parasite under examination. These are elongate, ribbon-like, segmented, and notched at the anterior end. They are found in certain special situations in the body-cavity of Cyprinoid fishes, and, unlike most scolices, when ready for their final transformation into the mature tape-worm, perforate the wall of the body of their host by their own efforts, and pass out into the water, whence they are taken up into the alimentary canal of some water-bird, in which they complete their development. Before proceeding with the comparison of the parasite of the *Hyla* with *Ligula* and *Schistocephalus* I shall give a detailed account of my observations on the minute structure of the former, as some of these are of importance as bearing on the question of affinities.

The whole surface is covered with a chitinous cuticle (fig. 3, *cut*), which consists of two layers, an outer thinner and an inner thicker. The outer layer is a homogeneous membrane in the anterior part of the body of my best-preserved specimen, while further back it is divided by numerous vertical fissures, so that in section it has the appearance of being composed of numerous close-set papillæ. The inner thicker layer is perfectly homogeneous. Beneath it is a thin layer of minute highly refracting bodies (*x*), which are apparently nothing else than thickened and specialised outer ends of the fibres of the parenchyma muscle, which are found to be continuous with them; and these bodies seem to be attached to an exceedingly thin continuous layer of similar appearance which immediately underlies the cuticle. The fibres of the parenchyma muscle would thus appear to be inserted not directly into the cuticle, but into a thin membrane—perhaps of elastic character—immediately underlying the latter.

At a little distance below this is an irregular layer (*ep*), of tolerably large nuclei, each having around it a small quantity of protoplasm which sends out slender fibre-like processes inwards and outwards. This layer doubtless represents an epithelium of vertically elongated cells of which the bodies are imperfectly developed or have become attenuated.

The greater part of the interior is in most parts of the body occupied by the form of connective tissue characteristic of Flatworms and commonly called parenchyma—a faintly granular uncolourable matrix having running through it felt-like bundles of very delicate fibres with stellate, angular or rounded nuclei here and there. Occasional cavities and channels occur in this ground-tissue. Embedded in it, especially in its outer part, are great numbers of the *calcareous corpuscles* (*cal*), so characteristic of Cestodes. These are rounded bodies which for the most part show a distinction into a central nucleus and an outer rind. The central part consists of a (usually) rounded body of strongly refracting appearance and perfectly homogeneous; while the outer part, which does not refract the light so strongly, is composed of several concentric layers. These bodies dissolve and nearly or completely disappear under the action of strong acids, but without effervescence. Caustic potash only renders the outer part clearer. From their appearance when acted on by dilute acid, it would appear that the two parts of the corpuscle are of different composition—the inner part becoming before it is entirely dissolved converted into a cluster of granules while the outer part never becomes granular, but only gradually becomes less and less distinct till a fine outline alone remains.

Separated from the epidermal layer by an interval of parenchyma with calcareous corpuscles is a zone of longitudinally-arranged muscular fibres (*l.m.*), divided into parallel bundles by intervals of parenchyma and parenchyma muscle. These are slender, elongated, nucleated fibres. A transverse or circular layer of muscle is entirely wanting.

Running through the parenchyma are numerous bundles of the very slender muscular fibres of the parenchyma (*p.m.*). Most of those are nearly at right angles to the surface, though many are oblique; as they approach the surface the fibres separate out from one another and divide to become attached in the manner already described.

Though a nervous system can be detected, it is very indistinct. In the head portion of the body a number of fibres having exactly

the appearance of the nerve fibres of Trematodes and Cestodes run forwards into a central mass of tissue having numerous particles of pigment embedded in it. Though this, from its relation to the nerve-fibres, is probably of the nature of a ganglion, it is scarcely distinguishable from the surrounding parenchyma, and does not contain a single cell that could be set down as a ganglion-cell. I did not succeed in tracing any nerve cords in the hinder part of the body.

The only internal organs that are well developed are the system of canals. A main trunk of considerable size runs along each side. This frequently bifurcates, so that two main canals may run parallel with one another through several segments—sometimes again joining to form one, or one of them breaking up into branches—the other continuing on as the main canal. The branches given off are numerous and these again divide and subdivide; the giving off of the branches has no regular relationship to the segments. The main trunks do not extend quite to the head end; their posterior terminations, in the absence of complete specimens, were not made out.

On comparing these observations with what I can find published regarding *Ligula* I observe many points of agreement. The general shape of the body—elongate and ribbon-like with somewhat irregular segmentation—is the same in both cases. The form of the head end is somewhat different apparently, and the dorsal and ventral sucking grooves present in *Ligula* are absent in the parasite of *Hyla*.

The account of the minute structure of *Ligula* given by Donnadieu* which is the only one, so far as I can ascertain, published of recent years, leaves a great deal to be desired, and has evidently not been drawn up from good preparations. The cuticle (epiderme), he describes as in several layers (*three* are represented in the figures) which increase in thickness from without inwards, which are perfectly homogeneous. His representation

* "Contributions à l'histoire de la Ligule;" 'Journal de l'anatomie et de la physiologie,' tome 13, 1877. The same remark applies to Duchamp's "Recherches sur les Ligules" (Paris, 1876).

of the rest of the minute structure is so totally different from what we find in other Cestodes that I think it cannot be correct; and there would be little advantage in attempting a detailed comparison. The mode of termination of the principal trunks of the canal system by opening in front in the neighbourhood of the sucking-grooves would seem to constitute an important difference between *Ligula* as described by Donnadieu and the frog-parasite; the presence in the former of distinct though immature reproductive organs is also an important distinguishing feature.

The histology—as regards the cuticle, subcuticular cell-layer, muscular fibres and “parenchyma”—is very similar to that of such mature *Tæniæ* as I have studied (*T. expansa* of the sheep, *T. crassicollis* of the cat, *Dibothrium microcephalum* of the sun-fish and *T. sp.*, of the emu); but the arrangement of some of these parts is slightly different. Thus the layer of circular muscular fibres, which is well developed in mature *Tæniæ*, is entirely absent here in the scolex from *Hyla aurea*, and the longitudinal fibres do not form the complete layer which they present in the former.

The entire structure of the parasite indicates unmistakably its Cestode nature; and superficial resemblances, at least, indicate a relationship with *Ligula*, but what comparisons I have been able to make between the two former as regards internal structure seem to point to considerable differences. The discovery of the mature worm can alone set at rest completely the question of the affinities of this remarkable parasite.

EXPLANATION OF PLATE.

Fig. 1.—Anterior portion of the Cestode parasite of *Hyla aurea*, magnified
From a preserved specimen.

Fig. 2.—Portion of a transverse section. $\times 100$.

Fig. 3.—A portion of a similar section. $\times 800$. *cut*, two-layered cuticle.
ep, ‘epidermis.’ *p.m.*, parenchyma muscle. *x*, layer in which
the fibres end. *l.m.*, longitudinal muscular fibres. *cal*, ca-

CONTRIBUTIONS TO A MORE EXACT KNOWLEDGE
OF THE GEOGRAPHICAL DISTRIBUTION OF
AUSTRALIAN BATRACHIA. No. I.

By J. J. FLETCHER, M.A., B.Sc.

On turning to the British Museum "Catalogue of Batrachia Salientia" (Second Edition by G. A. Boulenger, 1882) together with the "First and Second Reports on Additions to the B. M. Collection" (P.Z.S. 1886, p. 411; 1890, p. 323), it will be found that about fifty-two species are distributed among the different colonies approximately as follows—allowance being made for certain additional species, as noted below, of which in the B. M. Collection there do not happen to be specimens from every colony in which they are known to occur :—*

Queensland	31 + 1† = 32
New South Wales	30 + 4‡ = 34
Victoria.....	7 + 2§ = 9
South Australia.....	2¶
West Australia.....	14
Tasmania.....	8

* Some general observations on geographical distribution will be found in two papers by the late G. Krefft in *Papers and Proc. Roy. Soc. Tasmania*, 1865, p. 16, and *Industr. Prog. N.S.W.*, 1871, p. 741, both, however, now somewhat out of date.

† *Mixophyes fasciolatus*.

‡ *Limnodynastes dorsalis*, *Hyla aurea*, *H. rubella*, *Phanerotis* (*antea*, p. 593); excluding *Crinia georgiana* as doubtful for reasons previously recorded.

§ *Limnodynastes dorsalis* (*vide* McCoy's *Prodromus*, Dec. V. pl. 42, fig. 2) and *L. peronii* of which I sent a specimen from Warragul to the British Museum, along with the type of *Crinia victoriana*, Blgr. (both collected by Mr. R. T. Baker).

¶ From the Abstract in *Archiv für Naturgesch.* Jahrg. xxx., Bd. ii., p. 208, it appears that Peters (*Mon. Berl. Ac.* 1863, p. 228) described or recorded six species [including *Helioporus* (*Neobatrachus*) *pictus*] from S. Australia; but I am unable to refer to this paper.

The broad facts relating to the geographical distribution of these species may be summed up somewhat as follows:—

- (1) Certain species are apparently very widely distributed, twelve of the fourteen species recorded from the West Coast occurring also on the East Coast, as well as, in some cases, in intermediate (coastal) districts.
- (2) Some species are widely distributed in, but as far as present knowledge goes appear to be confined to, one or other of these regions, such species at present being more numerously represented in Eastern Australia (possibly in some measure due to more systematic collecting in more accessible localities).
- (3) Other species are still less widely distributed, some being remarkably local, or at least recorded only from single localities (e.g. *Hyla jerrisiensis*, *H. dimolops*).
- (4) Little is known of the Batrachia of districts remote from the coast, the habitats recorded being with but very few exceptions and these for only few specimens (e.g. *Chiroleptes platycephalus*, *Notaden bennettii*, *Heleioporus pictus*) coastal.
- (5) The falling off in the number of species in the southern colonies is possibly and very probably in some degree rather apparent than real.

As Batrachia are not confined to the coastal districts, and as the species were originally described chiefly in instalments as representatives of new species reached Europe or America, and without reference to the general batrachian fauna of the particular localities whence the types came, it is obvious that the subject of geographical distribution is not yet exhausted. Indeed, Port Jackson perhaps excepted, it is hardly possible at present to draw up an exhaustive list of the frogs of any particular place, notwithstanding that some species have been recorded from numerous localities.

As a first small contribution towards a more detailed knowledge I now propose to record three collections from localities in this colony sufficiently remote from one another to be of interest, two

of them west of the Dividing Range, several other smaller and less complete inland collections also being taken into account.

(i.) *The Coastal division of N.S.W. (East of the Dividing Range).*

(a) From Dunoon, Richmond River (collected by R. Helms).

This collection comprising about eighty individuals referable to twelve species was obtained during a month's general collecting (March-April, 1890), under very unfavourable conditions of weather, floods and impassable roads confining the collector to a limited area. The species obtained were :—

CYSTIGNATHIDÆ—*Mixophyes fasciolatus*, Gthr.

Limnodynastes peronii, D. & B.

salminii, Stdchr.

tasmaniensis, Gthr.

Cryptotis brevis, Gthr.

Phanerotis fletcheri, Blgr.

BUFONIDÆ—*Pseudophryne bibronii*, Gthr.

coriacea, Keferst.

HYLIDÆ—*Hyla cœrulea*, White.

dentata, Keferst.

lesueurii, D. & B.

As regards individuals, *H. cœrulea* was most numerously represented, examples in many stages being present. The adults, as also those of *Mixophyes* and *H. lesueurii*, are large and very fine specimens, considerably larger than any I have had from other parts of N.S.W. Of most interest were five specimens of *Phanerotis*, of which the two largest are 48 and 42 mm. respectively from snout to vent; both have the two inner fingers fringed on the sides; and while one is almost devoid of rosy spots, the other is more profusely blotched than the type specimen, as for example on the upper surface of the fore-limbs, and edging the dark border on the hind limbs, as well as indications of a few less conspicuous blotches on the dorsal surface of the body. Mr. Helms informs me that *Phanerotis* is a brush-haunting species, and is well endowed with saltatory powers.

Good collections have several times been obtained in the equally favourable neighbouring district of the Clarence, so that it is not surprising that only two species in the above list (viz. *H. dentata*, and *Phanerotis*) are new to the portion of the colony in question, or that, from the circumstances already mentioned, three species previously recorded (from the Clarence) should not have been represented, viz., *Chiroleptes australis*, *Hyla peronii*, and *H. nanuta*.

(b) From Illawarra (specimens collected by Messrs. A. G. Hamilton, T. G. Sloane, and myself).

Omitting *Limnodynastes salmini*, *Phanerotis*, *Pseudophryne coriacea* (perhaps also *Cryptotis*) from the above list we shall get very much such a collection as one can make with a little trouble in the Illawarra district whence I know of the following species:—

<i>Mixophyes fasciolatus</i>	<i>Hyla cœrulea</i>
<i>Limnodynastes peronii</i>	<i>peronii</i> , Bibr.
<i>dorsalis</i>	<i>dentata</i>
<i>Crinia signifera</i>	<i>ewingii</i> var. <i>calliscelis</i>
<i>Pseudophryne australis</i>	<i>aurea</i>
<i>Hyla phyllochroa</i> , Gthr.	<i>lesueurii</i>

Hyla jerrisiensis, D. & B., from Jervis Bay is not known to me.

(c) From Burrungang about 20 miles inland but adjoining Illawarra, and at an elevation of about 2000 feet I have on various visits collected the following:—

<i>Mixophyes fasciolatus</i>	<i>Pseudophryne bibronii</i>
<i>Limnodynastes peronii</i>	<i>Hyla phyllochroa</i>
<i>tasmaniensis</i>	<i>ewingii</i> var. <i>calliscelis</i>
<i>Crinia signifera</i>	<i>krefftii</i> , Gthr.
<i>Hyperolia marmorata</i> , var.	<i>aurea</i>
	<i>Hyla lesueurii</i>

In this locality *Limnodynastes peronii*, *Crinia signifera*, and *Pseudophryne bibronii* are extremely common. Of *Mixophyes*, *L. tasmaniensis*, and *H. aurea* I have taken only a single example in each case.

(d) From the Blue Mts. [Springwood (1500 ft.) to Mount Wilson (3400 ft.)]—I have collected the following except *Helioporus albo-punctatus*, received from Mr. Hamilton whose son found it between Mt. Victoria and Hartley Vale.

<i>Mixophyes fasciolatus</i>	<i>Pseudophryne australis</i>
<i>Limnodynastes peronii</i>	<i>bibronii</i>
<i>dorsalis</i>	<i>Hyla phyllochroa</i>
<i>Cryptotis brevis</i>	<i>ewingii</i> var. <i>calliscelis</i>
<i>Crinia signifera</i>	<i>peronii</i>
* <i>Helioporus albo-punctatus</i> (?)	<i>citropus</i>

Of these I have seen *Hyla citropus* only from Mt. Wilson, and *Cryptotis brevis* only from Springwood. *Hylella bicolor* is recorded by Mr. Krefft from the Blue Mts., but I have not met with it.

For comparison a list of the twenty species occurring in the neighbourhood of Sydney (County of Cumberland) is appended; of the species included I have myself collected specimens of all but *Hyla lesueurii* of which Mr. Helms recently brought me a specimen from Clifton; and *H. dimolops*, and *Hylella bicolor* of which as yet I have no personal knowledge.

<i>Limnodynastes peronii</i>	<i>Hyla dentata</i>
<i>tasmaniensis</i>	<i>ewingii</i> , var. <i>calliscelis</i>
<i>dorsalis</i>	<i>krefftii</i>
<i>Crinia signifera</i>	<i>citropus</i>
<i>Hyperolia marmorata</i>	<i>aurea</i>
<i>Pseudophryne australis</i>	<i>latopalmata</i>
<i>bibronii</i>	<i>lesueurii</i>
<i>Hyla phyllochroa</i>	<i>freycineti</i>
<i>cærulea</i>	<i>dimolops</i>
<i>peronii</i>	<i>Hylella bicolor</i>

* This specimen is referred with some doubt to *H. albo-punctatus*, the tympanum not being hidden.

(ii.) *The inland division of N.S.W. (West of the Dividing Range).*

(e) From Narrabri on the Namoi (collected by Messrs. Henry Deane, and T. G. Sloane).*

Limnodynastes tasmaniensis *Hyperolia marmorata*
Pseudophryne bibronii *Notaden bennettii*

(f) From Nundle on the Namoi (Mr. Froggatt, Sent.)
Crinia signifera.

(g) From Coolah on the Talbragar (collected by Mr. Albert Cox).
Limnodynastes tasmaniensis *Hyla cœrulea*
Pseudophryne bibronii *peronii*

(h) From Guntawang and Cullenbone, near Mudgee, on the Cudgegong (collected by Messrs. A. G. Hamilton and J. D. Cox).

Limnodynastes peronii *Hyperolia marmorata*
 tasmaniensis *Heliodorus pictus*, Ptrs.
 fletcheri, Blgr. *Pseudophryne bibronii*
 dorsalis *Hyla cœrulea*
 ornatus *peronii*
Crinia signifera *aurea*
 Hyla lesueurii

Mr. Hamilton sent me all the above from Guntawang; Mr. Cox sent me living specimens of *L. dorsalis*, and *H. lesueurii* from Cullenbone. This is an interesting collection remarkable for the presence of what Mr. Boulenger considers to be a new species, as well as for the unexpected occurrence of *L. ornatus*, and *H. lesueurii*, both of which from previous records would appear to be coastal species; the latter especially is very common in the

* The morning after the meeting at which this paper was read Mr. C. T. Musson, F.L.S., arrived from Narrabri, and very kindly handed over to me a number of frogs, enabling me to supplement the above list as follows:—

(a) From Narrabri:—*Limnodynastes salmii*
 Hyla cœrulea
 peronii

(β) From Tamworth on the Peel:—*Hyla cœrulea*
 peronii
 lesueurii

Mr. Musson tells me that he also had a specimen of *Notaden* from Narrabri, but that it was unfortunately left behind.

Mudgee district. From its occurrence in some of the other collections *L. salminii* might have been expected. *Helioporus pictus* must be rare as there is only a single specimen in the collection; its only other recorded locality in N.S.W. is Rylstone in the same district.

(i) At Capertee (2700 feet) close to or almost on the Divide, I found the following species common:—

Limnodynastes tasmaniensis *Crinia signifera*
Pseudophryne bibronii *Hyla ewingii* var. *calliscelis*

(j) From Warren on the Macquarie (collected by Mr. C. Thacker).

Limnodynastes salminii *Notaden bennettii*

(k) From Dandaloo on the Bogan (collected by Mr. Alleine Fletcher). Eighty specimens referable to the following species:—

Limnodynastes salminii *Notaden bennettii*, Gthr.

tasmaniensis *Hyla caerulea*

Chiroleptes platycephalus, Gthr. *peronii*

Hyperolia marmorata *rubella*

Hyla latopalmata

This also is an interesting collection, though *Limnodynastes dorsalis*, *Crinia signifera*, and *H. aurea* at least might have been expected. Of greatest interest perhaps is the occurrence of *Hyla rubella* (seven specimens), a species not previously recorded from New South Wales, except by Keferstein (who merely gives N.S.W.), in reference to which it may be remarked that though Keferstein was indebted to Mr. Krefft and Dr. Schuette for the specimens described in his paper, nevertheless Mr. Krefft writing two years after Keferstein says of the distribution of *H. rubella* "North-east and North" [Coast of Australia], nor does he mention it as a N.S.W. species in any of his papers. The presence of *H. latopalmata* (fourteen specimens), previously recorded only from coastal localities is also interesting. The species most numerous represented was *L. tasmaniensis* (27 specimens).

This collection which was made chiefly in the hope of getting *Notaden bennettii*, was sent to me in two instalments, the first representing the frogs obtained from June to December, during which period *Notaden* was never once met with. In April,

however, the species made its appearance abundantly, and numbers might have been obtained. Thirteen specimens sent as a sample are all smaller than Mr. Deane's fine example from Narrabri; and some of them have their fingers and toes extraordinarily worn down as if they had had to burrow under difficulties. My correspondent has been unable to obtain any information as to the oviposition and breeding habits of this remarkable toad, which I suspect will prove to be interesting. He tells me, however, that *Notaden* avoids water, is useless for fish-bait, and he feels sure feeds largely upon ants. In an article in *Science Gossip* (Feb. 1890, p. 37), I found subsequently that an observer in Queensland also refers to the ant-eating propensity of *Notaden*.

(1) From Mulwala on the Murray (collected by Mr. T. G. Sloane).

Crinia signifera

Limnodynastes tasmaniensis

dorsalis

In addition to the above Mr. Sloane tells me that *Hyla aurea* is very common at Mulwala, but that he was unable to bring specimens. Mr. Sloane has also shown me two specimens of *Notaden bennettii*, which have been in his possession since 1880, and which were given to him as having been obtained at Lalaltee, 26 miles N.W. of Mulwala, but that of his own knowledge he is not certain that such was the case. If this habitat is correct, the occurrence of *Notaden* so far south is very interesting.

Mr. Krefft (Trans. Phil. Soc. N.S.W. 1862-1865 [1866] p. 32) records *Limnodynastes dorsalis*, *Hyla aurea*, *H. peronii*, *H. cœrulea*, and *H. Adelaidensis*, as occurring on the Lower Murray.

At Hay and Wagga, both on the Murrumbidgee, in Sept. and Oct., 1889, I noticed that *Limnodynastes tasmaniensis*, *Hyla aurea*, *H. peronii*, and a fourth species whose croak I did not recognise and of which I was unable to obtain specimens, were common; in addition to which at Wagga I found one specimen of *Crinia signifera*. At both places the river being high, and the swamps from the backwater being full, it was difficult to procure specimens, sheltering logs or stones being conspicuously absent.

From the foregoing facts the following conclusions may be drawn :—

(1) Of about thirty-four species with which N.S.W. may at present be credited, all but five are to be found inhabiting the strip of coast east of the Dividing Range extending from the northern border to Jervis Bay (the district to the south of this being left out of consideration at present), the majority of which are more or less universally or widely distributed (Australian) species, several are species better represented in Queensland which appear to reach their southern limit in the northern part of the district in question (e.g. *Chiroleptes australis*, *Pseudophryne coriacea*, perhaps also *Phanerotis*) while at least four (*Hyla dentata*, *H. citropus*, *H. jervisiensis*, and *H. dimolops*) are not at present known to occur out of it.

(2) Of the thirty-four species above-mentioned eighteen (comprising representatives of the three dominant Australian families) are now recorded as occurring in the districts of the colony west of the Dividing Range, of which five (*Chiroleptes platycephalus*, *Limnodynastes fletcheri*, *Helioporus pictus*, *Notaden bennettii*, and *Hyla rubella*,) are not known to occur in the coast region of N.S.W. ; the remainder being more or less widely distributed species. The common frogs of the interior of the colony thus include such species as *Limnodynastes tasmaniensis*, *L. dorsalis*, *Crinia signifera*, *Hyperolia marmorata*, *Notaden bennettii*, *Hyla caerulea*, *H. aurea*, and *H. peronii*. The rest, or some of them, may perhaps be widely distributed but appear to be rarer ; or have not been collected from sufficiently numerous localities to furnish data for any very definite statements about them.

A few species occurring in the Richmond and Clarence district, or further to the north, shade off into the interior, though not known to occur much further to the south, or only sparingly ; such are *Limnodynastes ornatus*, *L. salmini*, and *H. rubella* ; a glance at the map is suggestive of a possible derivation arising out of the proximity of the sources of the eastern and western waters in this part of the colony.

As the collections herein recorded from the interior of the colony were, for the most part, obtained on the upper waters of tributaries of the River Darling, and as in a region with a comparatively small rainfall periodically subject to severe droughts it is not unreasonable to suppose that the distribution of the amphibia has been in some measure directed and regulated by the rivers, some of the species enumerated may be expected to occur further to the south in districts drained by the lower waters of the great river system of the colony.

Several observers have mentioned remarkable facts about burrowing frogs (*e.g.* Sanger, Atkin, Lumholtz, and recently several writers in the Melbourne *Australasian*) and their power of withstanding droughts; and though the identification of the species, and more detailed information are desirable, yet, in the absence of more definite knowledge, it would be rash to suppose that, though probably most flourishing and abundant in proximity to the rivers, frogs are unable to exist at any considerable distance from these even in the driest parts of the colony. Moreover, floods, particularly such a memorable flood as that of this year, during which in places the Darling is said to have been from twenty to forty miles wide, probably exercise a not inconsiderable distributing and replenishing influence, and do much to counteract the evil effects of a succession of prolonged dry seasons. Indeed it is much to be desired that naturalists who have the chance would give us some detailed information based on personal observations as to the more obvious general effects of a succession of dry seasons followed by a big flood on the fauna of particular districts.

In conclusion I have to thank very warmly the several gentlemen mentioned, who by much personal inconvenience in conveying jars of spirit long distances, and by taking so much trouble to preserve specimens, have enabled me to record so many interesting species from new habitats. The correct determination of the species may be relied on as Mr. G. A. Boulenger, of the British Museum, has most kindly given me the benefit of his knowledge and experience in all cases about which I had any doubt; and therefore to him also I beg to express my cordial thanks.

DESCRIPTION OF A LUMINOUS DIPTEROUS INSECT
(FAM. MYCETOPHILIDÆ), FROM NEW ZEALAND.

BY FREDERICK A. A. SKUSE,
ENTOMOLOGIST TO THE AUSTRALIAN MUSEUM.

In this contribution the imago form of the luminous larva originally discovered by Mr. Meyrick (Entom. Mon. Mag., 1886) in Wellington, New Zealand, and since investigated and reared by Mr. G. V. Hudson of that town, is described. The insect, as asserted by Baron Osten-Sacken from an examination of specimens of the larva (Entom. Mon. Mag. XXIII., p. 133), belongs to the Mycetophilidæ, and is now described as *Bolitophila luminosa*. The Baron, however, was of opinion (*in litt.*, June 30th, 1889), that the larvæ he had for inspection bore unmistakably the characters of *Sciophila*, and were very unlike those of *Bolitophila*. According to Mr. Hudson's observations on the life-history of this insect, which together with the appended description, are to be published elsewhere, "the imago itself is highly luminous, brighter than the pupa, but not nearly so bright as the full-grown and vigorous larva" (*in litt.*, Sept. 17th, 1890).

Fam. MYCETOPHILIDÆ.

Sect. BOLITOPHILINÆ.

Genus BOLITOPHILA, Hoffm.

Bolitophila, Hoffm., Meigen, Syst. Besch. I. p. 220, pl. 8, figs. 1-4, 1818; Macquart, S. à B. Dipt. I. p. 126, 1834; *Messala*, Curtis, Brit. Entom. XIII. p. 581, figs. 1-3, 1836; *Bolitophila*, Walker, Ins. Brit. Dipt. III. p. 71, pl. xxiii. fig. 7, 1856; Winnertz, V. z-b. G. Wien, XIII. p. 672, pl. xix., fig. 5, 1863.

Head small, roundish, fore part flattened. Eyes broadly oval, a little emarginate on the inner side above. Ocelli three, arranged

in a somewhat bent line on the front. Palpi prominent, incurved, cylindrical, four-jointed; first joint very small, the following of almost equal length, the fourth the longest. Antennæ setaceous, pubescent, in the ♂ as long as, in the ♀ shorter than the body, 2 + 15-jointed; the joints of the scapus cyathiform; the flagellar joints cylindrical, the terminal one very small, almost gemmiform. Thorax small, oval, highly arched; scutellum small, roundish; metathorax acclivous. Halteres large. Abdomen very long, slender; in ♂ linear, subcylindrical, 8-segmented, without the anal joint; in ♀ laterally compressed, 9-segmented, the last segment small. Legs long and slender; tibiæ with very short, weak spurs; the fore tibiæ with a single range of spines on the inner side, and the hind pair with one range on the inner, and two ranges of shorter and weaker spines on the outer side. Wings large, microscopically pubescent, as long as, or somewhat longer than the abdomen, with obtusely-cuneiformly narrowed base; incumbent in repose. Costal vein uniting with the tip of the third longitudinal vein at, or somewhat beyond the apex of the wing; auxiliary vein complete, joining the costa, united to the first longitudinal vein by the subcostal cross-vein; third longitudinal vein with an anterior branch (which is sometimes wanting), the branch short, almost vertical, ending in the tip of the first longitudinal vein or in the costa, small cross-vein short, situated about midway between the origin of the third longitudinal vein and the inner end of the second posterior cell; fourth longitudinal vein starting from the base of the fifth longitudinal vein; fork of the fifth longitudinal vein united at its base to the fourth longitudinal vein by a short cross-vein; sixth longitudinal vein perfect.

BOLITOPHILA LUMINOSA, sp n.

♀.—Length of antennæ.....	0·090 inch	...	2·27 millimètres.
Expanse of wings.....	0·250 × 0·070	...	6·34 × 1·77
Size of body.....	0·380 × 0·040	..	9·64 × 1·01

Antennæ very slender, as long as the head and thorax combined,

joints elongate, progressively diminishing in thickness, brown. Hypostoma brown. Palpi yellow. Front and vertex black. Thorax black or very deep brown, levigate, with a median yellow line, the humeri and lateral borders pale yellow or whitish; two convergent rows of short black hairs, from humeri to scutellum; some black bristly hairs above the origin of the wings; pleuræ deep brown, tinged with pale yellow; scutellum black; metanotum brown, bordered laterally with yellow. Halteres pallid, the club black. Abdomen slender, sub-cylindrical, five times the length of the thorax, dusky brown, the segments indistinctly (especially the hindmost ones) tinged with yellowish anteriorly; densely clothed with very short black or dark brown hairs; extremity and lamellæ of the ovipositor yellow. Legs long and very slender. Coxæ pale yellow or whitish, the fore and intermediate pairs with the extreme apex, and the hind pair with almost the apical half, dusky brown; trochanters dusky brown; femora pale yellow or whitish, the hind pair black at the apex; tibiæ and tarsi black. Tibial spurs black. In the fore-legs the tibiæ and metatarsi of about equal length; the tarsi twice the length of the tibiæ. Wings shorter than the abdomen, pellucid, with a delicate yellowish tint, and almost the apical half infuscated with grey. Costal vein uniting with the tip of the third longitudinal vein somewhat beyond the apex of the wing; auxiliary vein terminating in the costa opposite or somewhat beyond the inner end of the second posterior cell, the subcostal cross-vein situated near its base; first longitudinal vein running straight into the costa opposite a point before the tip of the posterior branch of the fourth longitudinal vein; third longitudinal vein gently arcuated at its base, strongly arcuated towards its tip; posterior branch of the fifth longitudinal vein abruptly reaching the margin.

Hab.—Wellington, New Zealand (G. V. Hudson). Bred during September.

Obs.—In this species, as in the European *Bolitophila tenella*, Winn., the anterior branch of the third longitudinal vein is wanting.

NOTES AND EXHIBITS.

Mr. Skuse exhibited a specimen of *Bolitophila luminosa*, described in his paper. Also, specimens of the galls of *Cecidomyia frauenfeldi*, Sch., described by Dr. Schiner (Novara-Exp., Bd. II., p. 7) in 1868, from Narrabeen Lagoon, Port Jackson. The species, which was originally discovered by Herr v. Frauenfeld, is, in a note attached to the description of the species, stated to have been bred from a species of *Melaleuca*. It has now been ascertained that the plant in question is *Leptospermum lævigatum*, and not a *Melaleuca*.

Mr. Maiden exhibited a fresh fruit of *Colocynthis* (*Citrullus colocynthis*, Schrad.), also a bulb of Indian Squill (*Urginea indica*, R. Br.), both grown at Bombay; also, on behalf of Dr. T. L. Bancroft, of Brisbane, hymenopterous galls (probably Cynipidæ) found on *Acacia Cunninghamii*, Hook., and *Acacia penninervis*, Sieb.

Mr. Palmer exhibited and pointed out some of the peculiar characters of a number of living insect larvæ (including *Myrmecleo* sp.); and also a Coccinelid (*Epilachna 28 punctata*), and a Galerucid (*Aulacophora* sp.), which infest Curcubitaceæ and Solanaceæ.

Mr. Fletcher showed a number of the rarer and more interesting frogs noticed in his paper.

WEDNESDAY, 26TH NOVEMBER, 1890.

Dr. James C. Cox, Vice-President, in the Chair.

The Chairman addressed the Meeting as follows :—" At the last Meeting of the Society only one month ago our esteemed President, Professor William John Stephens, M.A., F.G.S., was present with us and presided over our deliberations with his accustomed dignity and ability, and without any serious premonition of the mournful event which all too soon was to overtake us. As Senior Vice-President it now becomes my sorrowful duty to announce to you formally his decease on Saturday last, 22nd inst., after a short illness ; and in making this announcement I would at the same time ask to be permitted to give expression to my own sincere personal regret. Professor Stephens was a Member of Council during 1875 and 1876, President in 1877 and 1878, Vice-President in 1879 and 1880 ; Co-Honorary Secretary in 1881-84, and again President from 1885 until the close of his life a few days since. Thus by his long official connection with the Society dating from its very foundation, his regular attendance at our Meetings, and the zeal and ability displayed in the discharge of his various official duties, apart from his personal qualities and his contributions as a working member, our deceased President has earned our warmest gratitude and approval. As resolutions suitable to the occasion will be brought forward for your consideration, and in view of the Annual Meeting, now not far off, at which it is customary to deal more in detail with events which so directly concern the welfare of the Society, I need not longer occupy your attention on the present occasion."

The following Resolutions were then unanimously adopted :—

(i.) Proposed by Mr. R. Etheridge, and seconded by Mr. John Brazier, "That this Meeting desires to place on record an expression of its high appreciation of the long and valuable services rendered to the Society by our deceased President, Professor W. J. Stephens, M.A., F.G.S., of its regard for his memory, and of its profound regret for his untimely death."

(ii.) Proposed by Mr. Henry Deane, and seconded by Mr. P. R. Pedley, "That the sincere sympathy of this Meeting be tendered to Mrs. Stephens and family, together with an assurance of the high esteem in which Professor Stephens was held by the Society with which he was so long officially identified."

On the motion of Mr. P. N. Trebeck, seconded by Mr. T. G. Sloane, the reading of Papers and other business was deferred, and the Meeting adjourned out of respect to the memory of the late President.

WEDNESDAY, 31st DECEMBER, 1890.

Dr. James C. Cox, Vice-President, in the Chair.

A letter was read from Mrs. Stephens thanking the Members for their expression of sympathy. Letters were also read from the Royal Societies of Tasmania and South Australia conveying resolutions of regret and sympathy on the occasion of the Society's recent bereavement.

The Chairman announced that the Annual Meeting would be held on Wednesday evening, January 28th, 1891, to take precedence of the Ordinary Monthly Meeting on the same date.

DONATIONS.

"Catalogue of the Birds in the British Museum." Vols. XIII.; XV. and XVIII. (1890); "Catalogue of the Fossil Reptilia and Amphibia in the British Museum (Nat. Hist.)." Part iv. (1890); By R. Lydekker, B.A., F.G.S., &c.; "A Guide to the Exhibition Galleries of the Department of Geology and Palæontology." Parts I. and II. (1890). *From the Trustees.*

"Proceedings of the Royal Society of London." Vols. XLVI., No. 285; XLVII., Nos. 286-291; XLVIII., Nos. 292 and 293 (1890). *From the Society.*

"Annales de la Société Entomologique de Belgique." Tomes XXXII. & XXXIII. (1888-89). *From the Society.*

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"Archiv für Naturgeschichte." LVI. Jahrg., Band II., Heft 2 (1890). *From the Editor.*

"Mitteilungen des Vereins für Erdkunde zu Leipzig, 1889." *From the Society.*

"Department of Agriculture, N.S.W.—Bulletin, No. I. A Census of the Grasses of N.S.W., &c., by Fred. Turner, F.R.H.S.;" "Directions for Collecting Insects, Plants, &c." "Agricultural Gazette," Vol. I., Part 3. *From the Director.*

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"The Journal of the College of Science, Imperial University, Japan." Vol. III., Part 4 (1890). *From the President.*

"The Perak Government Gazette." Vol. III., Nos. 27-33 (October and November, 1890). *From the Government Secretary.*

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"Department of Agriculture, Victoria—Bulletin," Nos. 10-11 (September-October, 1890). *From the Secretary of Agriculture.*

"The Victorian Naturalist." Vol. VII., No. 7 (November, 1890). *From the Field Naturalists' Club of Victoria.*

"Journal of the Royal Microscopical Society of London." Ser. ii., Vol. VI., Part 1 (1886); and "for the year 1890." Part 3. *From the Society.*

"Bericht über die Senckenbergische naturforschende Gesellschaft in Frankfurt am Main, 1890." *From the Society.*

"The Transactions of the Entomological Society of London for the year 1890." Part III. *From the Society.*

"The Journal of Comparative Medicine and Veterinary Archives." Vol. XI., Nos. 5 and 10 (May and October, 1890). *From the Editor.*

"Bulletin of the Museum of Comparative Zoology at Harvard College, Cambridge, U.S.A." Vol. XX., No. 2 (1890). *From the Curator.*

"Proceedings of the United States National Museum, Washington." Vol. XIII., Nos. 813-820 (1890). *From the Museum.*

"Bulletin of the American Museum of Natural History, N. Y." Vol. III., No. 1, pp. 149-160 (1890); "Annual Report" (1889-90). *From the Museum.*

"Bulletin de la Société Zoologique de France pour l'Année 1890." Tome XV., No. 7 (July). *From the Society.*

"A Dictionary of the New Zealand Language." By the Right Reverend William Williams, D.C.L. 3rd edition. *From C. Hedley, Esq., F.L.S.*

"Among Cannibals." By Carl Lumboltz, M.A.; "First, Second, and Third Annual Reports on Insects and Fungi injurious to Crops, &c." (1887-89.) By C. Whitehead, F.L.S.; "Notes on *Icerya Purchasi* in South Africa." By Miss Omerod. *From J. J. Fletcher, Esq.*

"Horæ Societatis Entomologicæ Rossicæ." Tomes XXIII. and XXIV. (1889-90). *From the Society.*

"Records of the Australian Museum." Vol. I., No. 5 (1890). *From the Trustees.*

"Bulletin de la Société Belge de Microscopie." 16^me Année, Nos. 8-11 (1890). *From the Society.*

"Department of Agriculture, Queensland—Bulletin" No. 4 (October, 1890).—"Botany: Contributions to the Queensland Flora." By F. M. Bailey, F.L.S., Colonial Botanist. *From the Department.*

"The Australasian Journal of Pharmacy." Vol. V., No. 59 (November, 1890). *From the Editor.*

"The Scientific Proceedings of the Royal Dublin Society." (n.s.) Vol. VI., Parts 7-9 (1889-90). *From the Society.*

"Queensland.—Report on British New Guinea from data and notes by the late Sir Peter Scratchley, Her Majesty's Special Commissioner." By G. Seymour Foot (1886); "Five Annual Reports on British New Guinea" (1886-90). *From the Under-Secretary of Queensland, through the Librarian, Parliamentary Library, Brisbane.*

"Bulletins du Comité Géologique, St. Pétersbourg." Tome IX., Nos. 1-6 (1890); "Supplément au T. IX. des Bulletins." *From the Committee.*

"Verhandlungen des Naturhist. Vereines der Preussischen Rheinlande, Westfalens des Reg.-Bezirks Osnabruck." Funfte Folge. V. Jahrg., Erste Halfte (1888). *From the Society.*

"Annales de la Société Géologique de Belgique." Tome XVII., 3^e Livr. (1890). *From the Society.*

"Monatliche Mittheilungen des Naturwissenschaftl. Vereines des Regierungs-bezirkes Frankfurt." III. Jahrg., Nos. 3-4 (1885-86); IV., Nos. 6-7 (1886-87); VIII., Nos. 4-7 (1890-91); "Societatum Litteræ." I. Jahrg., Nos. 2 and 11 (1887); IV., Nos. 7-9 (1890). *From the Society.*

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"United States Geological Survey.—Monographs." Vols. XV. (2 Vols.), XVI. (1889); "Bulletin." Nos. 54-57 (1889-90); "Eighth Annual Report." 2 Vols. (1887). *From the Director.*

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"Proceedings of the Academy of Natural Sciences, Philadelphia, 1890." Part 1. *From the Society.*

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"Studies from the Morphological Laboratory in the University of Cambridge." Vols. I. (Part 2), II-IV., V. (Part 1). *From the Balfour Library, Cambridge.*

"Cincinnati Society of Natural History.—Journal." Vol. XIII., No. 1 (1890). *From the Society.*

"Wagner Free Institute of Science, Philadelphia.—Transactions." Vol. III. (1890). *From the Institute.*

"American Geographical Society, N.Y.—Bulletin." Vol. XXII., No. 3 (Sept., 1890). *From the Society.*

"American Naturalist." Vol. XXIV., No. 285 (Sept., 1890). *From the Editor.*

"Insect Life." Vol. III., Nos. 1 and 2. *From the Secretary of Agriculture, Washington.*

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"Queensland Museum.—Annual Report of Trustees for 1889." *From the Trustees.*

"Proceedings and Transactions of the Queensland Branch of the Royal Geographical Society of Australasia." Vol. V., Part 2 (1890). *From the Society.*

Pamphlet entitled, "Notes on the Hydrology of the Mitta Mitta." By J. Stirling, F.G.S., F.L.S. *From the Author.*

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"Proceedings of the Cambridge Philosophical Society." Vol. VII., Part ii. (1890). *From the Society.*

PAPERS READ.

CATALOGUE OF THE DESCRIBED HYMENOPTERA
OF AUSTRALIA.

BY WALTER W. FROGGATT.

In issuing this catalogue the compiler knows that it must be incomplete in many details, but hopes that, with all its defects, it may be of some practical use as a guide to those wanting to know what has been written, and where the information is to be found referring to our bees, ants and wasps. While most of the other large orders of insects have received a considerable amount of attention from writers on Australian Entomology, with the exception of the following writers, until quite recently, few others had given more than a passing glance at our Hymenoptera. Professor Westwood at a very early date described and nearly always added coloured figures of many of our finest wasps, and has done a great deal towards assisting students to work at this group. The late F. Smith, Esq., of the British Museum has described an immense number in the British Museum Catalogues and Proceedings of Scientific Societies; his clear and concise descriptions render it very easy to identify nearly all his species. While Henri de Saussure in his fine Monographs of the Vespidae and other groups has greatly advanced our knowledge of Australian Hymenoptera. The writings of Walker on the parasitic wasps, and Mayr on the ants must also be mentioned.

That the hymenopterous fauna of Australia is very extensive there is not the least doubt, for while possessing many genera peculiar to this country, most of the larger exotic ones are also represented. Yet there are several striking exceptions in genera with an otherwise world-wide range, as *Bombus* and *Osmia* among the bees, and *Cimbex* in the saw-flies. As might be expected in a country abounding in sandy, scrubby plains, the fossorial wasps are very numerous.

In concluding this preface, I must state that it is through the liberal assistance of Sir William Macleay, and the use of his library and collections that I am enabled to compile this catalogue. I am also greatly indebted to Mr. J. J. Fletcher of the Linnean Society, and Mr. F. A. A. Skuse of the Australian Museum, for the assistance I received from both these gentlemen in hunting up many obscure references and many useful hints in the course of this work.

Part I. contains the families *Tenthredinidæ* to the end of *Thynnidæ*; I have followed Kirby's classification.

Family TENTHREDINIDÆ.

This family was first noted from Australia by Klug in the "Berlin Magazine" 1814, when he formed the genus *Pterygophorus*, and described our two commonest species. Nothing is recorded about the habits of these insects, but I am enabled to give some information about their life-history from having bred some recently. The larvæ are of a dirty green colour with a broad head, tapering towards the tip of the abdomen, the anal segment being produced into a long, slender tail which curls over the back; they feed singly during the day on leaves of Eucalypts, and when full grown bore into dead wood, stopping up the entrance with the bits of wood gnawed out of the chamber in which they undergo their metamorphosis without forming any cocoon.

In 1817, Dr. Leach in his "Zoological Miscellanies," Vol. III., formed the genus *Perga* containing our largest and most brilliant saw-flies, which evidently take the place of the foreign genus *Cimbex*, to which they are closely allied; and he described six species. Then Westwood in his "Arcana Entomologica," 1841, and later on in the Proceedings of the Zoological Society, 1880, added greatly to the list. Other writers have described single species; Kirby's "List of Hymenoptera," Vol. I., 1882, gives a complete list of described saw-flies up to date, and describes a number of new species in the British Museum. The larvæ of

several species are common about Sydney, and are easily recognised by their habit of forming social clusters during the day, and ejecting a sticky yellow matter from near their mouths when disturbed.

Newman formed the genus *Eurys* in the "Entomologist," 1841, of which *E. nitidus*, Kirby, a bright metallic green saw-fly is the most common species, and can be frequently taken in the gardens about Sydney. In Kirby's list four more genera of saw-flies were added, and in the last number of the Proceedings of the Linnean Society of N. S. Wales, I have added another genus.

SECTION I.—"*Antennæ short, 6-jointed; joints 3-5, of equal length, not remarkably short.*"

Sub-Family CIMBICINÆ.

1. PERGA.

Perga, Leach, Zoological Miscellany, III. p. 115 (1817).

1 *AFFINIS*, Kirby, Brit. Mus. Cat. Hym. I. p. 19, pl. i. figs. 13 and 14, ♂, ♀ (1882).

Tasmania and Victoria.

BELLA, Newman, Entomologist, I. p. 89 (1841); Westw. Pro. Zool. Soc. 1880, p. 373, ♀.

Adelaide, S.A.; Tasmania.

BICOLOR, Leach, Zool. Misc. III. p. 116, pl. 148, fig. 5 (1817); Westw. P.Z.S. 1880, p. 371, ♀.

N. S. Wales, South Australia.

BISECTA, Kirby, Brit. Mus. Cat. Hym. I. pl. ii. fig. 4, ♀ (1882).
N. W. Australia.

5 *CAMERONII*, Westw. P.Z.S. 1880, p. 367, pl. xxxvii. fig. 3, ♀.
Australia.

CHRISTII, Westw. l.c. p. 366, pl. xxxvii. fig. 2, ♀.
Swan River, W.A.

CHALYBEA, Froggatt, P.L.S.N.S.W. (2), V. p. 285 (1890).
Nundle, N.S.W.; S. Australia.

692 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA,

CATANTRA, Kirby, Brit. Mus. Cat. Hym. I. p. 20, pl. i. fig. 6,
♀ (1882).

Sydney, N.S.W.

CRESSONII, Westw. P.Z.S. 1880, p. 368, pl. xxxvii. fig. 1.

Swan River, W.A.

10 DALMANII, Westw. l.c. p. 369, pl. xxxvii. fig. 2, ♀.

Goulburn River, Vic.

DORSALIS, Leach, Zool. Misc. III. p. 117, pl. cxlvi. fig. 1,

♂ (1817); Westw. P.Z.S. p. 362 (1880); *scutellata*,

Westw. Griff. Anim. Kingd. Ins. pl. 76, fig. 2; and

pl. 106, fig. 3, II. pp. 402 and 792, ♀; *eucalypti*,

Bennett and Scott, P.Z.S. 1859, p. 209, pl. LXII.; Kirby,

Brit. Mus. Cat. Hym. I. p. 18, pl. i. figs. 11 and 12,

♂, ♀ (1882).

N. S. Wales, Queensland, Victoria, and S. Australia.

ESENBECKII, Westw. P.Z.S. 1880, p. 365, pl. xxxv. fig. 5, ♀.

Swan River, W.A.

FERRUGINEA, Leach, Zool. Misc. III. p. 118, pl. 148, fig. 4

(1817); Westw. P.Z.S. 1880, p. 374; Kirby, Brit. Mus.

Cat. I. p. 24, ♀ (1882).

Sydney, N.S.W.

FOERSTERI, Westw. P.Z.S. 1880, p. 368, pl. xxxvi. fig. 1, ♂, ♀.

S. Australia; Sydney, N.S.W.

15 GLABRA, Kirby, Brit. Mus. Cat. Hym. I. p. 23, pl. ii. fig. 5, ♀
(1882).

Sydney, N.S.W.

GUERINII, Westw. P.Z.S. 1880, p. 367, pl. xxxv. fig. 1, ♂.

Australia.

GRAVENHORSTII, Westw. l.c. p. 366, pl. xxxv. fig. 7, ♀.

Australia.

HARTIGII, Westw. l.c. p. 369.

Australia.

KIRBYI, Leach, Zool. Misc. III. p. 117 (1816); Westw. l.c.

p. 371, pl. xxxvii. fig. 4; Kirby, Brit. Mus. Cat. p. 21,

pl. ii. fig. 2 (1882).

Swan River, W.A.

- 20 **KLUGII**, Westw. P.Z.S. 1880, p. 363, pl. xxxiv. figs. 1, 2.
Perth, Swan River, and Champion Bay, W.A.
- LATREILLII**, Leach, Zool. Misc. III. p. 116, pl. 148, fig. 2 (1817);
Westw. l.c. p. 372, pl. xxxvi. fig. 3; Kirby, Brit. Mus.
Cat. p. 25, pl. ii. fig. 8, ♂ (1882).
Sydney, N.S.W.; S. Australia.
- LEWISII**, Westw. Trans. Ent. Soc. I. p. 232 (1836); Arc. Ent.
I. p. 23, pl. vii. fig. 1 (1841); P.Z.S. 1880, p. 374, ♀.
N. S. Wales, Tasmania, and S. Australia.
- MACLEAII**, Westw. P.Z.S. 1880, p. 372, pl. xxxv. fig. 2, ♂.
Australia.
- NEWMANI**, Westw. l.c. p. 370, ♂.
Australia.
- 25 **PELETIERII**, Westw. l.c. p. 370, pl. xxxv. fig. 6, ♂.
Australia.
- POLITA**, Leach, Zool. Misc. III. p. 115, pl. 148, fig. 3 (1817);
Westw. l.c. p. 363; Kirby, Brit. Mus. Cat. p. 21, pl. ii.
fig. 1, ♂, ♀ (1882).
Moreton Bay, Q.; Sydney, N.S.W.; Victoria.
- SCABRA**, Newm. Zool. IV. p. 1274 (1846); Westw. l.c. p. 376.
Australia.
- SMITHII**, Westw. l.c. p. 375, pl. xxxvi. fig. 6, ♀.
Australia.
- SCHIODTEI**, Westw. l.c. p. 364, pl. xxxiv. figs. 3, 4, ♀.
Moreton Bay, Q.; Adelaide, S.A.; Swan River, W.A.
- 30 **SPINOLÆ**, Westw. P.Z.S. 1880, p. 371, pl. xxxvi. fig. 4, ♀.
Sydney, N.S.W.; Melbourne, Vic.
- UNIVITTATA**, Kirby, Brit. Mus. Cat. p. 25, pl. ii. fig. 7, ♀ (1882).
Australia.
- VENTRALIS**, Guér. (*Pseudoperga ventralis*) Icon. R. Anim. Ins.
p. 398 (1846); Westw. l.c. p. 376.
Tasmania.
- WALKERII**, Westw. l.c. p. 368, pl. xxxvi., fig. 5.
Sydney, N.S.W.

SECTION II.—“*Antennae 6-jointed; joints 3-5 so short that the club appears to spring almost immediately from the antennal tubercle. Abdomen rarely pointed, generally obtusely truncated at the extremity; hind femora more or less swollen.*”

HELINDA, Kirby, Brit. Mus. Cat. p. 27, pl. II. fig. 3, ♀ (1882).
S. Australia.

35 BRULLI, Westw. P.Z.S. 1880, p. 371, pl. XXXIV. fig. 6, ♂.
Moreton Bay, Q.; South Australia.

DAHLBOMII, Westw. l.c. p. 371, pl. XXXV. figs. 3, 4.
Swan River, W.A.

DUBIA, Kirby, Brit. Mus. Cat. p. 27, pl. II. fig. 9, ♂ (1882).
Swan River, W.A.

RITSEMEI, Westw. P.Z.S. 1880, p. 365, pl. XXXIV. fig. 7.
S. Australia; Swan River, W.A.

VOLLENHOVII, Westw. l.c. p. 365, pl. XXXIV. fig. 5.
Australia.

SECTION III.—“*Antennae 7-jointed, with a gradually-formed club.*”

40 AMENAIIDA, Kirby, Brit. Mus. Cat. p. 28, pl. II. fig. 10, ♂ (1882).
Adelaide, S.A.

DENTATA, Kirby, l.c. p. 29, pl. II. fig. 13, ♀.
Adelaide, S.A.

HALIDAI, Westw. P.Z.S. 1880, p. 377, pl. XXXVII. fig. 5, ♀
Victoria.

JUCUNDA, Kirby, Brit. Mus. Cat. Hym. p. 30, pl. II. fig. 14, ♀
(1882).
Perth, W.A.

JURINEI, Westw. P.Z.S. 1880, p. 378, pl. XXXVII. fig. 6, ♂.
Australia.

45 LEACHI, Westw. l.c. p. 377; Kirby, Brit. Mus. Cat. p. 30,
pl. II. fig. 11, ♀ (1882).
Melbourne, Vic.

MAYRII, Westw. l.c. p. 378, pl. xxxvii. fig. 6, ♀ (1880).

Swan River, W.A.

RUFOMACULATA, Kirby, Brit. Mus. Cat. p. 29, pl. ii. fig. 12, ♀ (1882).

Adelaide, S.A.

2. CEREALCES.

Cerealces, Kirby, Brit. Mus. List of Hymenoptera, I. p. 30.

SCUTELLATA, Kirby, Brit. Mus. Cat. p. 31, pl. ii. fig. 15, ♂ (1882).

S. Australia.

Sub-Family HYLOTOMINÆ.

3. TRICHORHACHUS.

Trichorhachus, Kirby, l.c. p. 39 (1882).

AUSTRALIS [HYLOTOMA (SCHIZOCERA)], Westw. Arc. Ent. I. p. 23, pl. vii. fig. 2 (1841).

West Australia.

50 SOBRINUS, Kirby, Brit. Mus. Cat. p. 39, pl. iii. fig. 3, ♂ (1882).
Australia.

HYALINUS, Kirby, l.c. p. 39, pl. iii. fig. 4, ♂.

Swan River, W.A.

NITIDUS, Kirby, l.c. p. 39, pl. iii. figs. 1, 2, ♂, ♀.

Swan River, W.A.

ABDOMINALIS, Kirby, l.c. p. 40, pl. iii. fig. 5, ♂.

Swan River, W.A.

Sub-Family PTERYGOPHORINÆ.

4. PTERYGOPHORUS.

Pterygophorus, Klug, Berl. Mag. VI. p. 279 (1814).

ANALIS, Costa, Ann. Mus. Nap. II. p. 66, ♀ (1864).

Goulburn River, Vic.; Adelaide, S.A.

55 BIFASCIATUS, Brullé, Hym. IV. p. 661, pl. xlvi. fig. 1 (1846).
Tasmania.

CINCTUS, Klug, Berl. Mag. VI. p. 278, pl. vii. figs. 1, 2 (1814);
Leach, Zool. Misc. III. p. 119, pl. cxlviii. fig. 6, ♂, ♀ (1817).

Victoria, to N. Coast.

696 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA,

CYANUS, Leach, Zool. Misc. III. p. 119, ♂, ♀ (1817).

Lower Plenty, Vic.

CYGNUS, Kirby, Brit. Mus. Cat. p. 81, pl. vii. fig. 10 (1882).

Swan River, W.A.

INTERRUPTUS, Klug, Berl. Mag. VI. p. 279, pl. vii. fig. 3 (1814);

Leach, Zool. Misc. III. p. 118, ♂, ♀ (1817).

Tasmania, to N. Coast, Australia.

60 LEACHII, Kirby, Brit. Mus. Cat. p. 82, pl. vi. fig. 9, ♂, ♀ (1882).

Port Bowen, Q.

5. PHILOMASTIX.

Philomastix, Froggatt, P.L.S.N.S.W. (2) V. p. 487 (1890).

GLABER, Froggatt, l.c. p. 489.

Richmond River, N.S.W.

NANCARROWI, Froggatt, l.c. p. 488.

Cairns, N. Queensland.

Sub-Family LOPHYRIDINÆ.

6. EURYS.

Eurys, Newman, Entomologist, p. 90 (1841).

ÆRATUS, Newman, Ent. p. 90, ♀ (1841).

Adelaide, S.A.

LAETUS (DICTYNNA), Westw. Arc. Ent. I. p. 24, pl. vii. fig. 4,

♀ (1841).

Tasmania; Adelaide, S.A.

65 NITIDUS, Kirby, Brit. Mus. Cat. p. 94, pl. vii. fig. 4, ♀ (1882).

Australia.

7. EURYOPSIS.

Euryopsis, Kirby, Brit. Mus. Cat. p. 95 (1882).

NITENS, Kirby, l.c. p. 95, pl. vii. fig. 5.

Adelaide, S.A.

8. POLYCLONUS.

Polyclonus, Kirby, Brit. Mus. Cat. p. 97 (1882).

ATRATUS, Kirby, l.c. p. 97, pl. vii. fig. 3, ♂.

Australia.

Family SIRICIDÆ.

Only one species of this small family of Hymenoptera has been described from Australia ; they are found in all parts of the world, but I do not think that they will turn out to be very numerous in this country.

Sub-Family SIRICINÆ.

9. SIREX.

Sirex, Linn. Faun. Suec. p. 396 (1761).

AUSTRALIS, Kirby, Brit. Mus. Cat. p. 383, pl. xv. fig. 12 (1882).

Australia.

Family CYNIPIDÆ.

I can not find any species of this family described from Australia, but there are at least six species in the Macleay collection, several of which I have bred out of galls during the last summer. One forms three-pronged galls about the size of a large pea, on the twigs of *Acacia discolor* growing in the neighbourhood of Sydney, which are full grown about the end of October, but the galls are so aborted by a small black chalcid that not more than 1 in 50 at that time contain the original maker. Another species forms large oval galls on the young stems of *Acacia longifolia*, hatching out in the early part of December. On the twigs of several species of Eucalypts a third species forms three-pronged galls which are placed in rows on either side of the twig. Systematic collecting and breeding from galls will no doubt bring many more species under our notice.

Family CHALCIDIDÆ.

Over 150 species of this extensive family have been described from this country, chiefly by Walker, Westwood, and Kirby, most of the larger foreign genera having their representatives here. As nothing has been done towards the classification of several of the sub-families containing the majority of the minute insects since Walker's time, the compiler has had to use his classification in the following list.

Sub-family LEUCASPINÆ.

10. LEUCASPIS.

Leucaspis, Fabr. Syst. Piez. p. 168.

DARLINGII, Westw. Thes. Entom. Oxon. p. 134, pl. xxv. fig. 4.
Darling Downs, Q.; Sydney, N.S.W.

70 AUSTRALIS, Walk. Notes on Chalcididæ, p. — (1872).
South Australia.

Sub-family CHALCIDINÆ.

11. EPITRANUS.

Epitranus, Walk. Ent. Mag. II. p. 26 (1834).

TELUTE, Walk. Ent. Mag. V. p. 471; *Smicra Telute*, Walk.
Hobart, Tasmania.

12. TRICHOXENIA.

Trichoxenia, Walk. Notes on Chalcididæ, III. p. 45 (1871).

CINERARIA, Kirby, Jour. Linn. Soc. XX. p. 35, pl. 1. figs. 4, 5
(1886).
N. S. Wales; Australia.

13. CHALCIS.

Chalcis, Fabricius, Syst. Piez.

ATRATA, Kirby, l.c. XVII. p. 76 (1883).
Queensland.

NITATOR, Walk. Trans. Ent. Soc. p. 345 (1862).
N. Australia.

75 PHYA, Walk. Ent. Mag. V. p. 471.
Sydney, N.S.W.

UCALEGON, Walk. Appen. Brit. Mus. Cat. Chal. p. 84 (1846).
Adelaide, S.A.

14. BRACHYMERIA, Holmgren.

SIDNICA, Holmgren, Eugen. Res. Hymen. p. 437.
Sydney, N.S.W.

15. HALTICHELLA.

Haltichella, Spinola, Ann. Mus. XVII. p. 148.

DEXIUS, Walk. Ent. Mag. V. p. 473 ; *Hockeria Dexius*, Walk.
King George's Sound, W.A.

ERACON, Walk. l.c. p. 473 ; *Hockeria Eracon*, Walk.
Hobart, Tasmania.

80 FABRICATOR, Walk. Trans. Ent. Soc. (3) I. p. 365 (1862-4).
Adelaide, S.A.

INDIGNATOR, Walk. l.c. p. 369.
Tasmania.

INTERNATA, Walk. l.c. p. 369.
Tasmania.

NYSSA, Walk. Ent. Mag. V. p. 473 ; *Hockeria Nyssa*, Walk.
Sydney, N.S.W.

PROXENUS, Walk. Mon. Chal. II. p. 8.
Hobart, Tasmania ; Sydney, N.S.W.

16. AGAMERION.

Agamerion, Haliday, Trans. Ent. Soc. III. p. 298.

85 GELO, Haliday, Trans. Ent. Soc. III. p. 298, ♂ ; Walk. Trans.
Ent. Soc. (3) I. p. 373 (1862) ; *Miscogaster gelo*, Walk.
Mon. Chal. II. p. 27.
Sydney, N.S.W. ; Adelaide, S.A.

Sub-Family EURYTOMINÆ.

17. EURYTOMA.

Eurytoma, Illiger, Rossi, Fauna Etrusca, II. p. 127.

ARETHEAS, Walk. Mon. Chal. II. p. 3.
King George's Sound, W.A.

PIDYTES, Walk. l.c. p. 2.
Hobart, Tasmania ; King George's Sound, W.A.

TELLIS, Walk. l.c. p. 2.
Sydney, N.S.W.

18. ISOSONA.

Isona, Walk. Ent. Mag. I. p. 14.

OLBUS, Walk. Mon. Chal. II. p. 3; *Eurytoma olbus*, Walk.
Sydney, N.S.W.

90 ORITIAS, Walk. l.c. p. 5.

King George's Sound, W.A.

RAVOLA, Walk. l.c. p. 4.

Hobart, Tasmania.

VOLUX, Walk. l.c. p. 3.

Hobart, Tasmania; King George's Sound, W.A.

Sub-Family TORYMINÆ.

19. MEGASTIGMUS.

Megastigmus, Spinola, Ann. Mus. XVII. p. 148.

BORUS, Walk. Mon. Chal. II. p. 5.

Hobart, Tasmania.

DRANCES, Walk. l.c. p. 5.

Hobart, Tasmania.

95 IAMENUS, Walk. l.c. p. 6.

Hobart, Tasmania.

20. CALLIMOME.

Callimome, Spinola, Ann. Mus. XVII. p. 148 (1811).

DAONUS, Walk. Ent. Mag. V. p. 474.

King George's Sound, W.A.

OSINIUS, Walk. Mon. Chal. II. p. 6.

King George's Sound, W.A.

VIBIDIA, Walk. l.c. p. 7.

Sydney, N.S.W.

Sub-Family EUCHARINÆ.

21. EUCHARIS.

Eucharis, Latreille, Gen. Crust. et Ins. IV. p. 20 (1809).

DELICATULA, Walk. Trans. Ent. Soc. (3), I. p. 376 (1862).
Tasmania.

- 100 **ERIBOTES**, Walk. Mon. Chal. II. p. 14.
Sydney, N.S.W. ; Hobart, Tasmania.
- FAUSTA**, Walk. l.c. p. 10.
Hobart, Tasmania.
- IMPLEXA**, Walk. Trans. Ent. Soc. (3), I. p. 377.
Tasmania.
- LARYMNA**, Walk. Appen. Brit. Mus. Cat. p. 86 (1846).
Australia.
- PYTTALUS**, Walk. l.c. p. 87.
Adelaide, S.A.
- 105 **PICEICORNIS**, Walk. Trans. Ent. Soc. (3), I. p. 376.
Sydney, N.S.W.
- BUFIVENTRIS**, Walk. l.c. p. 378.
Adelaide, S.A.
- SMARAGDINA**, Walk. l.c. p. 376.
Tasmania.
- THEOCLES**, Walk. Mon. Chal. II. p. 11.
Sydney, N.S.W.
- VALGIUS**, Walk. l.c. p. 11.
Sydney, N.S.W.
- 110 **XENIADES**, Walk. l.c. p. 15.
Sydney, N.S.W.

22. **TRICORYNA.**

- Tricoryna*, Kirby, Jour. Linn. Soc. XX. p. 29 (1866).
- IELLO** (*Eucharis*), Walk. Mon. Chal. II. p. 12 (1839) ;
Haliday, Entomologist, I. pl. p. fig. 3 (1842).
Hobart, Tasmania.

23. **METAGEA.**

- Metagea*, Kirby, Jour. Linn. Soc. XX. p. 30 (1866).
- ZALATES** (*Eucharis*), Walk. Mon. Chal. II. p. 13 ; Haliday,
Entomol. I. pl. p. fig. 4 (1842).
Australia.

24. PSILOGASTER.

Psilogaster, Blanchard, Hist. Anim. Art. III. p. 260 (1840).

PALLIPES, Brullé, Ins. Hymen. IV. p. 573, pl. xxxix. figs. 1, 2,
Tasmania.

25. RHIPIPALLUS.

Rhipipallus, Kirby, Jour. Linn. Soc. XX. p. 31 (1866).

VOLUSUS (*Eucharis*), Walk. Mon. Chal. II. p. 9 (1839);
Haliday, Entomol. I. pl. p. fig. 1 (1842).

King George's Sound, W.A.

115 CAMERONI, Kirby, Jour. Linn. Soc. XX. p. 37, pl. 1. figs.
2, 2a (1886).

Australia?

26. STILBULA.

Stilbula, Spinola, Ann. Mus. XVII. p. 150 (1811).

PEDUNCULARIS, Westw. Thes. Ent. Oxon. p. 155, pl. xxviii.
fig. 7 (1874).

27. SCHIZASPIDIA.

Schizaspidia, Westw. P.Z S 1835, p. 69.

RUDIS, Westw. Thes. Ent. Oxon. p. 152, pl. xxviii. fig. 5 (1874).
S. Australia.

Sub-family PERILAMPINÆ.

28. PERILAMPUS.

Perilampus, Swederus, Act. Stockh. (1784).

SALEIUS, Walk. Mon. Chal. II. p. 16.

King George's Sound, W.A.

29. EUCHRYZIA.

Euchryzia, Westw. Thes. Ent. Oxon. p. 139 (1874).

CLEPTIDEA, Westw. Thes. Ent. Oxon. p. 139, pl. xxvi. fig. 3.
Adelaide, S.A.

120 GBMMEA, Westw. l.c. p. 139, pl. xxvi. fig. 4.
Adelaide, S.A.

PRASINA, Westw. l.c. p. 140
W. Australia.

30. POLYCHROMA.

Polychroma, Westw. Thes. Ent. Oxon. p. 140 (1874).

CUPRESCENS, Westw. Thes. Ent. Oxon. p. 140 (1874).
Melbourne, Vic.

31. THAUMASURA.

Thaumasura, Westw. Trans. Ent. Soc. 1868.

TEREBRATOR, Westw. Trans. Ent. Soc. 1868, p. 36 ; Thes.
Ent. Oxon. p. 143, pl. xxvi. fig. 9.
Australia.

32. BELONEA.

Belonea, Westw. Thes. Ent. Oxon. (1874).

AUSTRALICA, Westw. Thes. Ent. Oxon. p. 146, pl. xxvii. fig. 7.
S. Australia.

125 ERYTHROPODA, Cameron, Proc. Soc. Manchester, XXVI.
p. 122.
S. Australia.

33. PANTHALIS.

Panthalis, Cameron, Proc. Soc. Manchester, 1888.

BLACKBURNI, Cameron, Proc. Soc. Manchester, XXVI. p. 121.
S. Australia.

Sub-family PTEROMALINÆ.

34. GASTRANCISTRUS.

Gastrancistrus, Westw. Lond. and Edin. Phil. Mag. (3) I.
p. 144.

MENCETES (*Miscogaster*), Walk. Mon. Chal. II. p. 20.
Sydney, N.S.W.

35. LAMPROTATUS.

Lamprotatus, Westw. Mag. Nat. Hist. VI. (1833).

BATO (*Miscogaster*), Walk. Mon. Chal. II. p. 22.
Hobart, Tasmania.

CIRON (*Miscogaster*), Walk. l.c. p. 16.
Hobart, Tasmania.

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130 DAMIA (*Miscogaster*), Walk. l.c. p. 21.

Sydney, N.S.W.

HICATCEUS (*Miscogaster*), Walk. l.c. p. 19.

Hobart, Tasmania.

MYBON (*Miscogaster*), Walk. l.c. p. 19.

Sydney, N.S.W.

NELO (*Miscogaster*), Walk. l.c. p. 17.

Sydney, N.S.W.

NICON (*Miscogaster*), Walk. l.c. p. 17.

Sydney, N.S.W.

135 THERA (*Miscogaster*), Walk. l.c. p. 18.

Hobart, Tasmania.

36. SELADERMA.

Seladerma, Walk. Ent. Mag. II. p. 288 (1863).

ATHINIS (*Miscogaster*), Walk. Mon. Chal. II. p. 26.

Sydney, N.S.W. ; King George's Sound, W.A.

CERNUS (*Miscogaster*), Walk. l.c. p. 22.

Hobart, Tasmania.

LETUS (*Miscogaster*), Walk. l.c. p. 26.

Hobart, Tasmania.

37. SEMIOTUS.

Semiotus, Walk. Ent. Mag. II. p. 290 (1863).

DICE (*Miscogaster*), Walk. Mon. Chal. II. p. 24.

King George's Sound, W.A.

140 MERULA (*Miscogaster*), Walk. l.c. p. 25.

Hobart, Tasmania.

THEOPE (*Miscogaster*), Walk. l.c. p. 25.

King George's Sound, W.A.

38. MICROMELUS.

Micromelus, Walk. Ent. Mag. I. p. 464 (1863).

SILANUS, Walk. Ann. Nat. Hist. XII. p. 46.

Hobart, Tasmania.

39. PTEROMALUS.

Pteromalus, Swederus, Act. Stockh. (1784).

BATON, Walk. Mon. Chal. II. p. 32.

Hobart, Tasmania.

BEBIUS, Walk. l.c. p. 31.

Sydney, N.S.W.

145 EUCTEMON, Walk. l.c. p. 31.

Sydney, N.S.W.

EUROPS, Walk. l.c. p. 30.

Sydney, N.S.W.

FABIA, Walk. l.c. p. 33.

King George's Sound, W.A.

GORGIAS, Walk. l.c. p. 34.

Sydney, N.S.W.

NIPHE, Walk. l.c. p. 20.

Hobart, Tasmania.

150 OCEIA, Walk. l.c. p. 30.

Hobart, Tasmania.

THESTOR, Walk. l.c. p. 29.

Hobart, Tasmania.

UNCA, Walk. l.c. p. 28.

Hobart, Tasmania.

Sub-family EUPELMINÆ.

40. EUPELMUS.

Eupelmus, Dalman, Kongl. Vet. Acad. Handl. (1820).

DODONE (*Calosoter*), Walk. Mon. Chal. II. p. 35.

King George's Sound, W.A.

UROZONUS, Dalman, Kongl. Vet. Acad. Handl. II. p. 378 (2),
pl. VIII. figs. 34-37 (1820.)

England ; Europe ; Sydney, N.S.W.

41. MYRMECOPSIS.

Myrmecopsis, Walk. Trans. Ent. Soc. 1865, p. 442.

155 NIGRICANS, Walk. Trans. Ent. Soc. (3). II. p. 442 (1865).

N. Australia.

Sub-family ENCYRTINÆ.

42. ERICYDNUS.

Ericydnus, Haliday, Entomol. (1842).

CHRYSOUS (*Pteromalus*), Walk. Mon. Chal. II. p. 34.

King George's Sound, W.A.

MEGALABUS (*Eulophus*), Walk. Ent. Mag. V. p. 477.

King George's Sound, W.A.

43. ENCYRTUS.

Encyrtus, Dalman, Kongl. Vet. Acad. Handl. (1820).

ARSANES, Walk. Mon. Chal. II. p. 36.

Hobart, Tasmania.

CHELES, Walk. l.c. p. 37.

Hobart, Tasmania.

160 LUCETIUS, Walk. l.c. p. 36.

Hobart, Tasmania; King George's Sound, W.A.

PACORUS, Walk. l.c. p. 39.

Sydney, N.S.W.

SALACON, Walk. l.c. p. 37.

Hobart, Tasmania.

XUTHUS, Walk. l.c. p. 38.

King George's Sound, W.A.

ZAMEIS, Walk. l.c. p. 39.

King George's Sound, W.A.

165' ZEBINA, Walk. l.c. p. 36.

Hobart, Tasmania.

Sub-family EULOPHINÆ.

44. ENTEDON.

Entedon, Dalman, Kongl. Vet. Acad. Handl. (1820).

HESTIA (*Eulophus*), Walk. Mon. Chal. II. p. 40.

Hobart, Tasmania.

PRONAPIS, Walk. l.c. p. 46.

Sydney, N.S.W.

DIOCLES, Walk. l.c. p. 40.

Sydney, N.S.W.

45. EUDERUS.

Euderus, Haliday, Trans. Ent. Soc. III. p. 298.
MESTOR (*Eulophus*), Walk. Mon. Chal. II. p. 44.
 King George's Sound, W.A.

46. OPHELIMUS.

Ophelimus, Haliday, Trans. Ent. Soc. III. p. 300.
 170 **SABELLA** (*Eulophus*), Walk. Mon. Chal. II. p. 41 ; *Cirrospilus*
prymno, Walk. l.c. p. 50. .
 Hobart, Tasmania.
URSIDIUS, Haliday, Trans. Ent. Soc. III. ; *Eulopus ursidius*,
 Walk. Mon. Chal. II. p. 44.
 Hobart, Tasmania.

47. EUPLECTRUS.

Euplectrus, Westw. Lond. & Edin. Phil. Mag. III.
BICOLOR (*Pteromalus*), Swederus, Kongl. Vet. Acad. Handl.
 1795, p. 204, fig. 2 ; *Elachestus albiventris*, Spinola,
 Ann. Mus. VII. p. 151 ; Nees, Hym. Ich. aff. Mon. II.
 146 ; *Euplectrus furnius*, Walk. Ann. Nat. Hist. XII.
 p. 48 ; *Euplectrus maculiventris*, Westw. Lond. & Edin.
 Phil. Mag. (3), I. 2, p. 128 ; *Eulophus bicolor*, Walk.
 Mon. Chal. II. p. 173 ; *Spalangia ? flavipes*, Boyer de
 Fonscol. Ann. Sci. Nat. 1832, p. 299, fig. 1.
 England ; Sweden ; St. Vincent Island ; Hobart, Tas.

48. ELACHESTUS.

Elachestus, Spinola, Ann. Mus. XVII. p. 151 (1811).
IDOMENE, Walk. Appendix Brit. Mus. Cat. Chal. pt. 1, p. 98
 (1846) ; *Eulophus artæus*, Walk. Mon. Chal. II. p. 41.
 Hobart, Tasmania.

49. EULOPHUS.

Eulophus, Geoffroy, Latr. Gen. Crust. et Ins. IV. (1810).
CICUTA, Walk. Mon. Chal. II. p. 43.
 Sydney, N.S.W.

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175 ITRA, Walk. l.c. p. 43.

Hobart, Tasmania.

TELESTAS, Walk. l.c. p. 42.

Sydney, N.S.W.

50. TETRASTICHUS.

Tetrastichus, Haliday, Westw. Lond. & Edin. Phil. Mag.
(3) I. p. 128.

ARBES (*Cirrospilus*), Walk. Mon. Chal. II. p. 55.

Hobart, Tasmania ; King George's Sound, W.A.

AUTONÆ (*Eulophus*), Walk. l.c. p. 45.

Hobart, Tasmania.

BAUCIS (*Cirrospilus*), Walk. l.c. p. 53.

King George's Sound, W.A.

180 DYNAS (*Eulophus*), Walk. l.c. p. 45.

Hobart, Tasmania.

FANNIUS (*Cirrospilus*), Walk. l.c. p. 49.

Hobart, Tasmania.

GLYCON (*Cirrospilus*), Walk. l.c. p. 54.

Hobart, Tasmania.

HIPPIASUS (*Cirrospilus*), Walk. l.c. p. 51.

Hobart, Tasmania.

LELAPS (*Cirrospilus*), Walk. l.c. p. 51.

King George's Sound, W.A.

185 NEIS (*Cirrospilus*), Walk. l.c. p. 49.

Hobart, Tasmania.

OTYS (*Cirrospilus*), Walk. l.c. p. 48.

Sydney, N.S.W.

PROTO (*Cirrospilus*), Walk. l.c. p. 47.

Hobart, Tasmania.

VALENS (*Cirrospilus*), Walk. l.c. p. 46.

Hobart, Tasmania.

XENARES (*Cirrospilus*), Walk. l.c. p. 54.

Hobart, Tasmania ; King George's Sound, W.A.

190 ZALEUCUS (*Cirrospilus*), Walk. l.c. p. 52.

Hobart, Tasmania.

Sub-family ?

51. OPHELOSIA.

Ophelosia, Riley, "Insect Life," U.S. Dept. Agric. II.
p. 248 (1890).

CRAWFORDI, Riley, Ins. Life, II. pts. 7, 8, p. 249, fig. 54.
Adelaide, S.A.

Family PROCTOTRUPIDÆ.

The only members of this family that I can find recorded from Australia are four species described by Westwood in his *Thesaurus Entomologicus*, Oxford, 1874, belonging to the sub-family *Bethyllides* (the peculiarities of which division he defines), and several species of those curious little insects which inhabit the centre of many figs, belonging to the sub-family *Blastophaginae*. These are described in the *Transactions of the Entomological Society of London*, 1883, where much interesting information is given about the habits of this group. My own observation of the many galls found in the vicinity of Sydney leads me to believe that this country is very rich in these minute parasitic Hymenoptera.

Sub-family BETHYLLINÆ.

52. EPYRIS.

Epyris, Westw. Trans. Ent. Soc. 1872.

PICEIVENTRIS, Westw. Thes. Ent. Oxon. p. 159, pl. xxix. fig. 10.
Melbourne, Vic.

PLATYCEPHALUS, Westw. l.c. p. 159, pl. xxix. fig. 9.
S. Australia.

53. EUPSENELLA.

Eupsenella, Westw. Thes. Ent. Oxon. 1872.

AGILIS, Westw. l.c. p. 168, pl. xxx. fig. 6.
N. W. Australia.

54. GONIOZUS.

Goniozus, Thomson, Sver. Proctrup. in Overs. Kong. Vet Akad. Forhandl. XVIII. p. 451.

195 ANTIPODUM, Westw. l.c. p. 169, pl. xxxi. fig. 1.
Adelaide, S.A.

Sub-family BLASTOPHAGINÆ.

55. PLEISTODONTES.

Pleistodontes, Saunders, Trans. Ent. Soc. Lond. 1883.

IMPERIALIS, Saund. Trans. Ent. Soc. 1883, p. 10.
Sydney, N.S.W.

56. IDARNELLA.

Idarnella, Westw. Trans. Ent. Soc. Lond. 1883.

ATERRIMA, Saund. Trans Ent Soc. 1883, pt. 4, p. 389
Sydney, N.S.W.

Family ICHNEUMONIDÆ.

Hardly anything has been done with this very large family of Hymenoptera, the members of which play such an important part in destroying immense numbers of lepidopterous and other larvæ. Brullé's *Histoire Naturelle des Insectes Hyménoptères*, T. IV. 1846, is the principal work from which my list is taken, and I have therefore adhered to his classification, though Foerster's, given in his *Synoptical Tables* of this family (1868), is now being generally adopted. The difficulty of finding out the hosts of the larvæ, and the great amount of trouble necessary to do satisfactory work at these interesting insects has, no doubt, deterred entomologists from working at this group.

Sub-Family PIMPLINÆ.

57. EPHIALTES.

Ephialtes, Gravenhorst, Ichneumologia Europæa (1829)

ANNULATUS, Brullé, Hym. IV. p. 86.
Tasmania

58. PIMPLA.

Pimpla, Fabr. Syst. Piez. (1804).

INTERRUPTA, Brullé, l.c. p. 91.

Australia.

200 INTRICATORIA (*Cryptus*), Fabr. Syst. Ent.; Brullé, Hym. IV
p. 90; *excavata*, Le Guillou, Ann. Soc. Ent. France, X.
p. 302.

Sydney, N.S.W.

TERMINALIS, Brullé, l.c. p. 96.

Australia.

TRILINEATA, Brullé, l.c. p. 90.

Australia.

59. WESTWOODIA.

Westwoodia, Brullé Hym. IV. p. 126.

RUFICEPS, Brullé, Hym. IV. p. 127, pl. xli. fig. 2.

Tasmania.

60. RHYSSA.

Rhyssa, Gravenhorst, l.c.

SEMIPUNCTATA, Kirby, Trans. Ent. Soc. 1883, p. 202.

Australia and New Zealand.

61. ORTHOCENTRUS.

Orthocentrus, Gravenhorst, l.c.

205 BIFASCIATUS, Brullé, Hym. IV. p. 115.

Tasmania.

Sub-Family OPHIONINÆ.

62. OPHION.

Ophion, Fabr. Ent. Syst. Suppl. (1798).

COARCTATUS, Brullé, Hym. IV. p. 147.

Australia.

63. PANISCUS.

Paniscus, Gravenhorst, l.c.

PRODUCTUS, Brullé, Hym. IV. p. 156.

Tasmania.

64. MACRUS.

Macrus, Gravenhorst, l.c.

† RUFIVENTRIS, Brullé, Hym. IV. p. 164, pl. XLII. fig. 4.
Tasmania.

65. ANOMALON.

Anomalon, Gravenhorst, l.c.

COARCTATUM, Brullé, Hym. IV. p. 176.
Australia.

210 FLAVITARBI, Brullé, l.c. p. 171.
Tasmania.

66. CRYPTUS.

Cryptus, Fabr. Syst. Piez. (1804).

AUSTRALIS, Tschek. Verh. z.-b. Gesell. Wien, XX. p. 116
(1870).
Australia.

FLAVO-CINCTUS, Brullé, Hym. IV. p. 198.
Australia.

67. MESOSTENUS.

Mesostenus, Gravenhorst, l.c.

LUCTUOSUS, Brullé, Hym. IV. p. 226.
Australia.

PHYSOSCELUS, Brullé, l.c. p. 240.
Australia.

68. HEMIGASTER.

Hemigaster, Brullé, l.c. p. 266.

215 LUTEUS, Brullé, Hym. IV. p. 268.
Australia.

Sub-family ICHNEUMONINÆ.

69. JOPPA.

Joppa, Fabr. Syst. Piez. (1804).

AUSTRALASIÆ, Brullé, Hym. IV. p. 281.
Australia.

70. LIMNERIA.

Limneria, Holm. C. R. Hym. (1858-68).SIDNICA, Holm. Eugen. Res. I. Hym. p. 414.
Sydney, N.S.W.

71. ICHNEUMON.

Ichneumon, Linn. Syst. Nat. I. p. 930 (1767).AUSTRALIS, Brullé, Hym. IV. p. 309.
Tasmania.ISCHIOLEUCUS, Brullé, l.c. p. 310.
Tasmania.

Family BRACONIDÆ.

This is also a family that has been much neglected, at anyrate in Australia, no doubt for the same reasons as the preceding one ; and though I can find only eight species described from this country, most of which are in Brullé's *Hist. Nat. des Ins. Hymenoptères*, yet there are a vast number of these busy little insects that from their small size are often overlooked when the bigger Ichneumons are observed, though they do quite as much, if not more, service to man in destroying larvæ of destructive insects.

72. BRACON.

Bracon, Fabr. Syst. Piez. (1804).220 LIMBATUS, Brullé, Hym. IV. p. 433.
Tasmania.PULCHELLUS, Brullé, l.c. p. 432.
Australia.

73. ISCHIUS.

Ischius, Holm. Eugen. Res. (1858-68).LEUCOGASTER, Holm. Eugen. Res. Hym. p. 429.
Sydney, N.S.W.

74. MYOSOMA.

Myosoma, Brullé, l.c. p. 450.MUTATOR (*Bracon*), Fabr. P. Syst. Ins. ; Brullé, Hym. IV.
p. 453.

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75. SYNGASTER.

Syngaster, Brullé, l.c. p. 454.

ANNULICORNIS, Brullé, Hym. IV. p. 459.

Australia.

225 LEPIDUS, Brullé, l.c. p. 459.

Tasmania.

76. AGATHIS.

Agathis, Latr. Crus. et Ins. IV. p. 9 (1809).

BICOLOR, Brullé, Hym. IV. p. 483.

Australia.

DIMIDIATA, Brullé, l.c. p. 487.

Hobart, Tasmania.

Family EVANIIDÆ.

The first genus of the family comprises those wasps parasitic in the egg cases of the cockroach, and as we find several species in Australia that are common to Europe and other parts of the world, it is not unlikely that they have been introduced into this country. Westwood (Trans. Ent. Soc. 1850) has described a number of Australian species, and more recently in the *Thesaurus Entomologicus* (1874) has added to his list. Within the last few years Schletterer has written a splendid monograph of this family (Verhandlungen der k.k. Zoologisch-Botanischen Gesellschaft, Wien, 1885-90, continued in the Annalen des k.k. Naturhistorischen Hofmuseums, Wien, 1889-90), in which the genus *Fœnus* of Fabricius is struck out, and the prior name *Gasterupton*, Latreille, substituted, and a great number of new species described.

77. EVANIA.

Evania, Fabr. Syst. Ins. (1775).

AUSTRALIS, Schl. Ann. Hofm. Wien, IV. p. 172 (1889).

Verh. z.-b. Gesell. Wien, XXXVI. p. 12 (1886)

Adelaide, S.A.

ANGULATA, Schl. Ann. Hofm. Wien, IV. p. 167.

Sydney, N.S.W.; Adelaide, S.A.

- 230 APPENDIGASTER, Fabr. Syst. Ins. p. 345; Schl. Verh. z.-b. Gesell. Wien, XXXVI. p. 10 (1886).

Australia.

EXIMIA, Schl. l.c. p. 20; Ann. Hofm. Wien, IV. p. 176.

Sydney, N.S.W.

GENALIS, Schl. Verh. z.-b. Gesell. Wien, XXXVI. p. 23;

Schl. Ann. Hofm. Wien, IV. p. 162.

Rockhampton, Q.

HELLERI, Schl. Verh. z.-b. Gesell. Wien, XXXVI. p. 25;

Schl. Ann. Hofm. Wien, IV. p. 165.

S. Australia.

HUMERATA, Schl. Ann. Hofm. Wien, IV. p. 173.

Adelaide, S.A.

- 235 LÆVIGATA, Latr. Gen. Crus. et Ins. III. p. 251; Westw.

Trans. Ent. Soc. III. p. 241 (1841-3).

Australia.

LONGIGENA, Schl. Ann. Hofm. Wien, IV. p. 163.

Sydney, N.S.W.

LUCIDA, Schl. l.c. p. 175.

Australia.

MUELLERI, Schl. l.c. p. 170.

Australia and New Britain.

PERFIDA, Westw. Trans. Ent. Soc. (n.s.), I. p. 216; Schl.

Ann. Hofm. Wien, IV. p. 162.

Tasmania.

- 240 PRINCIPES, West. Trans. Ent. Soc. III. p. 243 (1841-43);

Ann. Mag. Nat. Hist. VII. p. 536 (1841); Schl. Verh.

z.-b. Gesell. XXXVI. p. 32; Schl. Ann. Hofm. Wien,

IV. p. 178.

N. S. Wales, Woodlark I., and N. Guinea.

SERICANS, Westw. Trans. Ent. Soc. (n.s.) I. p. 215; Schl.

Ann. Hofm. IV. p. 171.

King George's Sound, W.A.

SCABRA, Schl. l.c. p. 168.

Australia.

716 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA,

TASMANICA, Westw. Trans. Ent. Soc. III. p. 243 (1841-43);
Ann. Mag. Nat. Hist. VII. p. 536 (1841); Schl. Verh.
z.-b. Gesell. Wien, XXXVI. p. 32 (1886); Schl. Ann.
Hofm. Wien, IV. p. 165 (1889).

Tasmania.

78. GASTERUPTION.

Gasteruption, Latr. Précéd. Caract. &c. p. 113 (1796);
Fœnus, Fabr. Ent. Syst. Suppl. p. 240 (1798); Schl.
Ann. Hofm. Wien, IV. p. 373.

ANTENNALE, Schl. Ann. Hofm. Wien, IV. p. 414 (1890).

Australia.

245 AUSTRALE, Westw. Trans. Ent. Soc. III. p. 259 (1841-43);
P.Z.S. 1835, p. 51; Schl. Ann. Hofm. Wien, IV. p. 303
(1889).

Australia.

BRACHYURUM, Schl. Verh. z.-b. Gesell. XXXV. p. 293 (1885);
Ann. Hofm. Wien, IV. p. 438 (1890).

Tasmania.

CORIACEUM, Schl. Ann. Hofm. Wien, IV. p. 443 (1890),
Fœnus gracilis, Smith, Proc. Linn. Soc. III. p. 169.

Victoria.

DARWINII, Westw. Trans. Ent. Soc. III. p. 259, ♂; Schl.
Ann. Hofm. IV. p. 305 (1890).

Australia.

DUBIUM, Schl. Verh. z.-b. Gesell. XXXV. p. 294 (1885);
Schl. Ann. Hofm. Wien, p. 440 (1890).

Swan River, W.A.

250 DEWITZI, Schl. Ann. Nat. Hofm. Wien, IV. p. 442 (1890)

Australia.

DOLICHOCEPHALUS, Schl. l.c. p. 445.

S. Australia.

CRASSICEPS, Schl. l.c. p. 462; *Fœnus Hollandiar*, Guér. Icon.
Regn. Anim. p. 407.

S. Australia.

FALLAX, Schl. l.c. p. 461.

Queensland.

FLAVITARSE, Guér. Icon. Regn. Anim. p. 407, ♀ ; Schl. Verh. z.-b. Gesell. Wien, XXXV. p. 295 (1885); Ann. Nat. Hofm. Wien, IV. p. 452 (1890); *Fœnus flavitarsis*, Trans. Ent. Soc. (n.s.) I. p. 278.

Swan River, W.A.

255 **GENALE**, Schl. Ann. Nat. Hofm. Wien, IV. p. 436 (1890).

Rockhampton, Q.

HOLLANDIÆ, Guér. Icon. Regn. Anim. Ins. p. 407 (1828); Schl. Verh. z.-b. Gesell. XXXV. p. 308 (1885).

Australia.

HUMERALE, Schl. Ann. Hofm. Wien, IV. p. 459 (1890).

S. Australia.

INERME, Schl. l.c. p. 457.

Australia.

LEUCOPUS, Schl. l.c. p. 450.

Sydney, N.S.W.

260 **LONGICOLLE**, Schl. Verh. z.-b. Gesell. XXXV. p. 296 ; Schl. Ann. Hofm. Wien, IV. p. 446 (1890).

Sydney, N.S.W.

MALAICUM, Schl. Verh. z.-b. Gesell. XXXV. p. 246 ; Schl. Ann. Hofm. Wien, IV. p. 455.

Australia.

MACRONYX, Schl. Ann. Hofm. Wien, IV. p. 463.

Australia.

NOVÆ-HOLLANDIÆ, Schl. Verh. z.-b. Gesell. XXXV. p. 297 ; Schl. Ann. Hofm. Wien, IV. p. 449.

Sydney, N.S.W.

OCULARE, Schl. Ann. Hofm. Wien, IV. p. 437.

Sydney, N.S.W.

265 **PATELLATUM**, Westw. Trans. Ent. Soc. (n.s.) III. p. 221 (1850) ; Schl. Verh. z.-b. Gesell. Wien, XXXV. p. 311 ; Schl. Ann. Nat. Hofm. Wien, IV. p. 458.

Australia.

PEREGRINUM, Schl. Verh. z.-b. Gesell. Wien, XXXV. p. 298 ; Schl. Ann. Hofm. Wien, IV. p. 447.

Sydney, N.S.W.

718 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA,

PEDUNCULATUM, Schl. Ann. Hofm. Wien, IV. p. 466; *Fœnus unguiculatus*, Westw. Ann. & Mag. Nat. Hist. VII. p. 53 (1841); Westw. Trans. Ent. Soc. III. p. 259 (1850); *Fœnus unguicularis*, Sm. Trans. Ent. Soc. 1876, p. 480, pl. iv. fig. 8; *Fœnus unguicularis*, Hutton, Cat. N.Z. Ins.

Australia and New Zealand.

PLICATUM, Schl. Ann. Hofm. Wien, IV. p. 466.

Sydney, N.S.W.

RHAPHIDIODES, Westw. Trans. Ent. Soc. (n.s.) I. p. 220;

Schl. Verh. z.-b. Gesell. XXXV. p. 299; Schl. Ann.

Hofm. Wien, IV. p. 444.

Sydney, N.S.W.

270 ROGENHOFERI, Schl. Verh. z.-b. Gesell. XXXV. p. 299; Schl.

Ann. Hofm. Wien, IV. p. 458 (1890).

Swan River, W.A.

RUFUM, Westw. Trans. Ent. Soc. (n.s.), I. p. 260 (1850);

Westw. Ann. Mag. Nat. Hist. VII. p. 537 (1841);

Schl. Ann. Hofm. Wien, IV. p. 464 (1890).

Australia.

SIMILLIMUM, Schl. l.c. p. 448.

S. W. Australia.

SPINIGERUM, Schl. l.c. p. 441.

Rockhampton, Q.

STEINDACHNERII, Schl. Verh. z.-b. Gesell. Wien, XXXV.

p. 300 (1885); Schl. Ann. Hofm. Wien, IV. p. 446.

Sydney, N.S.W.

275 TENELLUM, Schl. Ann. Hofm. Wien, IV. p. 437.

Queensland

TERMINALE, Westw. Trans. Ent. Soc. III. p. 258 (1841-43).

Westw. Ann. Mag. Nat. Hist. VII. p. 537; Schl. Verh.

z.-b. Gesell. Wien, XXXV. p. 381.

Australia and Tasmania.

THORACICUM, Guér. Icon. Regn. Anim. Ins. p. 437 (1828);

Schl. Verh. z.-b. Gesell. Wien, XXXV. p. 314.

Australia

UNGUICULATUM, Westw. Ann. Mag. Nat. Hist. VII. p. 537,
♂ (1841); Westw. Trans. Ent. Soc. III. p. 257, ♂
(1841-43); Schl. Verh. z.-b. Gesell. Wien, XXXV. p. 315.
Australia.

VALVULARE, Schl. Ann. Hofm. Wien, IV. p. 438.
Sydney, N.S.W.

280 VARIEGATUM, Schl. Verh. z.-b. Gesell. Wien, XXXV. p. 302;
Schl. Ann. Hofm. Wien, IV. p. 453.
Sydney, N.S.W.; Melbourne, Vic.

79. MONOMACHUS.

Monomachus, Klug, MSS. Westw. l.c. p. 126.

ANTIPODALIS, Westw. Thes. Ent. Oxon. p. 126, pl. xxiv. fig. 1.
(1874).
Melbourne, Vic.

80. AULACUS.

Aulacus, Jurine, Nouv. Méth. Hym. et Dipt. I. p. 89
(1807).

APICALIS, Westw. Trans. Ent. Soc. III. p. 267, pl. xiv. fig. 7,
(1841-43); Westw. Ann. Mag. Nat. Hist. VII. p. 538,
♂ (1841); Schl. Ann. Hofm. Wien, IV. p. 516; *varie-*
gatus, Shuckard, Entomologist, I. p. 125, ♀.
Australia.

CINGULATUS, Westw. Trans. Ent. Soc. III. p. 267 (1841-43);
Ann. Mag. Nat. Hist. VII. p. 538 (1841); *A. cingulatus*,
Schl. Ann. Hofm. Wien, IV. p. 513.

Swan River, W.A.; N. S. Wales; and S. Australia.

CORDATUS, Schl. Ann. Hofm. Wien, IV. p. 514.
Rockhampton, Q.

285 FORMOSUS, West. Trans. Ent. Soc. 1863, p. 330; Westw.
Thes. Ent. Oxon. p. 126, pl. xxiv. fig. 1 (1874); Schl.
Ann. Hofm. Wien, IV. p. 512.
Melbourne, Vic.

FLAVOGUTTATUS, Westw. Trans. Ent. Soc. (n.s.) I. p. 223
(1850); Schl. l.c. p. 516.
Queensland and South Australia.

720 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA,

LATERITIUS, Westw. Trans. Ent. Soc. III. p. 267 (1841-43).
Australia.

MERENS, Westw. Trans. Ent. Soc. 1868, p. 331; Westw.
Thes. Ent. Oxon. p. 129, pl. xxiv. fig. 6 (1874); Schl
l.c. p. 517.

Adelaide, S.A.

RUBIDUS, Schl. l.c. p. 510.

Queensland.

290 *RUFITARSIS*, Westw. Trans. Ent. Soc. 1868, p. 330; Schl.
l.c. p. 541.

Tasmania.

RUFUS, Westw. Trans. Ent. Soc. III. p. 266 (1841-43);
Westw. Ann. Mag. Nat. Hist. VII. p. 538 (1841);
Schl. l.c. p. 511.

81. *MEGALYRA*.

Megalyra, Westw. Trans. Ent. Soc. III. (1841-43).

FASCHIPPENNIS, Westw. l.c. p. 270, pl. xv. fig. 3, ♂ (1841-43);
Westw. Griff. Anim. Kingd. Ins. p. 419, pl. 66, fig. 4, ♀.
Australia.

82. *STEPHANUS*.

Stephanus, Jurine, Nouv. Méth. Hym. et Dipt. I. p. 91
(1809).

DAMELLICUS, Westw. Thes. Ent. Oxon. p. 126, pl. xxiv. fig. 1
(1874).

Australia.

Family CHRYSIDIDÆ.

We are indebted to Mr. F. Smith of the British Museum for descriptions of nearly all the following species, for until the appearance of his "Revision of the Hymenopterous genera *Cleptes*, &c." (Trans. Ent. Soc. London, 1874), no species of these handsome insects had been described from Australia. There is no doubt that this list will be very much enlarged when our entomologists take up this group, as the insects are found all over Australia, and are very plentiful in many places. Though most

of them are considered to be restricted in their range, *Stilbum amethystinum*, Fab., is found all over the warmer portions of the old world and Australia.

83. CHRYSIS.

Chrysis, Linn. Syst. Nat. ed. xii. I. p. 947 (1767).

AGILIS, Sm. Trans. Ent. Soc. 1874, p. 457.

Queensland.

295 BIPARTITUS, Sm. l.c. p. 462.

Australia.

FAUSTUS, Sm. l.c. p. 457.

Queensland.

FESTINUS, Sm. l.c. p. 462.

Perth, W.A.

GEMMATUS, Sm. l.c. p. 461.

Australia.

IMPERIOSUS, Sm. l.c. p. 460.

Moreton Bay, Q.

300 INTERCEPTOR, Sm. l.c. p. 457.

Hunter River, N.S.W.

INTRUDENS, Sm. l.c. p. 458.

Australia.

PARALLELUS, Sm. l.c. p. 458.

Australia.

REVERSUS, Sm. l.c. p. 457.

Tasmania.

VIRIDIFRONS, Sm. l.c. p. 457.

Tasmania.

305 RADOSZKOWSKYI, Gribodo, Ann. Mus. Genova, XIV. p. 335 (1879).

Australia.

84. PYRIA.

Pyria, St. Farg. Enc. Méth. X. (1825).

DREWSINI, Gribodo, l.c. XIV. p. 325 (1879).

Australia.

722 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA,

PROTEUS, Sm. Trans. Ent. Soc. 1874, p. 465.

North and West Australia, Swan River, Lizard Island.

VIOLACEA, Sm. l.c. p. 465.

Swan River, W.A.

85. STILBUM.

Stilbum, Spinola, Ins. Ligur. II. (1808).

AMETHYSTINUM (*Chrysis*), Fabr. Syst. Ent. p. 359, ♂; Ent. Syst. II. p. 243; Syst. Piez. p. 176; *Chrysis calens*, Fabr. Syst. II. p. 239; Syst. Piez. p. 171; Rossi, Faun. Etrus. II. p. 74; *Stilbum splendidum*, Brullé, Hist. Nat. des Ins. Hym. (St. Farg.) IV. p. 15, ♂, ♀; Dahlb. Hym. Eur. II. p. 358; Gerst. Peters' Reise Mosamb. p. 519; Sm. Jour. Linn. Soc. IV. p. 144; *Stilbum calens*, Spin. Ins. Ligur. I. p. 9; Brullé, Nat. Hist. Hym. IV. p. 16; Dahlb. Hym. Eur. II. p. 360, ♂, ♀; Lucas, Expl. Sc. de l'Alger. III. p. 315, pl. xvii. fig. 13; Chevr. Chrys. du Bassin du Léman, 7; *Stilbum weismali*, Dahlb. Hym. Eur. II. p. 359, ♂; *Stilbum amethystinum*, Sm. Jour. Linn. Soc. IV. p. 177.

Australia, Africa, Europe, and Asia.

310 SPLENDIDUM (*Chrysis*), Fabr. Syst. Ent. p. 357, ♀; Ent. Syst. II. p. 238; Syst. Piez. p. 170; Sm. Trans. Ent. Soc. 1874, p. 469.

Sydney, Moreton Bay, Pt. Essington, and Swan River.

Family FORMICIDÆ.

A considerable number of Australian ants have been described, and as many of our species have a very wide range, across to India and Africa, some have been redescribed very often as new species.

In Smith's British Museum Catalogue (1858) a number of new species were described, and those described previously, catalogued. Lowne, in the "Entomologist," Vol. II. (1865), described eighteen new species from the neighbourhood of Sydney; while Mayr, in several papers, more particularly "Myrmecologische Studien"

(Verh. k.k. z.-b. Gesell. Wien, XII. p. 649), "Neue Formiciden" *Ibid.* XX. p. 939), and "Die Australischen Formiciden" (Journal des Museum Godeffroy, Heft XII. p. 56), has described the greater number of our known species, and, therefore, I have followed his arrangement of the genera.

86. FORMICA.

Formica, Linn. Syst. Nat. 1735.

AUROCINCTA, Sm. Brit. Mus. Cat. Hym. p. 39 (1858).

Adelaide, S. A.

CONSECTATOR, Sm. l.c. p. 38.

Australia.

CONSOBRINA, Erichs. Wieg. Arch. V. p. 258, No. 228 (1842).

Tasmania.

DETECTA, Sm. Brit. Mus. Cat. Hym. p. 36.

Hunter River, N.S.W.

315 MACROCEPHALA, Erichs. Wieg. Arch. V. p. 229, No. 259 (1842).

Tasmania.

PILIVENTRIS, Sm. Brit. Mus. Cat. Hym. p. 39.

S. Australia.

PROCIDUA, Erichs. Wieg. Arch. V. p. 230, No. 259 (1842).

Tasmania.

PURPUREA, Sm. Brit. Mus. Cat. Hym. p. 40.

Melbourne, Vic.

STRENUA, Haliday, Trans. Linn. Soc. XVII. p. 329.

Australia.

320 SUFFUSA, Sm. Brit. Mus. Cat. Hym. p. 38.

Australia.

VIRESCENS, Fabr. Syst. Ent. 392-9; Spec. Ins. I. 490, 73;

Mant. Ins. I. 308, 16; Ent. Syst. II. 355, 23; Oliv. Enc.

Méth. VI. 494, 20; Gmelin, Syst. Nat. Ins. II. 2800

32; *Formica longinoda*, Latr. Hist. Nat. Fourm. 184;

Formica macra, Guér. Voy. Coq. Zool. II. 202;

Lasius virescens, Fabr. Syst. Piez. 417, 8.

Africa and Australia.

87. CAMPONOTUS.

Camponotus, Mayr, Europ. Formic. p. 35 (1861).

ÆNEOPILOSUS, Mayr, Verh. z.-b. Gesell. Wien, XII. p. 665 (1862); Journ. Mus. Godef. XII. p. 63.

Cape York, Gayndah, Rockhampton, Peak Downs; Sydney.

ALBOPILUSUS, Mayr, Journ. Mus. Godef. XII. p. 61 (1876).
Rockhampton, Peak Downs, &c.

ARQUATUS, Mayr, l.c. p. 63.
Rockhampton, Q.

325 *CAPITO*, Mayr, l.c. p. 64.
Peak Downs, Q.

ONEREUS, Mayr, l.c. p. 62.
Peak Downs, Q.

CLARIPES, Mayr, l.c. p. 64.
Peak Downs; Gayndah, Q.

COMPRESSUS, Fab. Mant. Ins. I. 307, Ent. Syst. II. 305, 2; Syst. Piez. 396, 2; Oliv. Enc. Méth. VI. p. 491; Latr. Hist. Nat. Fourm III.; Hardw. Zool. Journ. IV. 114, St. Farg. Hym. I. 214, 17; Jerdon, Madras Journ. 185, 119; Ann. & Mag. Nat. Hist. (2) XIII. p. 103; Sm. Journ. & Proc. Linn. Soc. II. p. 53; *Formica indefessa*, Sykes, Trans. Ent. Soc. I. 104, p. 13, f. 6.

India to Australia.

CRENULATUS, Mayr, Journ. Mus. Godef. XII. p. 64 (1876).
Rockhampton, Q.

330 *DORYCUS*, Sm. Journ. & Proc. Linn. Soc. V. Sup. p. 96 (1860).
Cape York, N.A.; and N. Guinea.

EPHIPPIUM, Sm. Brit. Mus. Cat. Hym. p. 39 (1858); Rog. Verz. d. Form. p. 4 (1863).
Rockhampton, and Peak Downs, Q.

EXTENSUS, Mayr, Journ. Mus. Godef. XII. p. 65 (1876).
Rockhampton, Q.

INFLATUS, Lubbock, Nature, XXIII. p. 258 (1881).
Adelaide, S.A.

INTREPIDUS (*Formica*), Kirby, Trans. Ent. Soc. p. 477 (1817);
Sm. Brit. Mus. Cat. Hym. p. 37 (1858); Rog. Verz. d.
Form. p. 4 (1863); *Formica agilis*, Sm. Brit. Mus.
Cat. Hym. p. 37 (1858); *Camponotus magnus*, Mayr,
Verh. z.-b. Gesell. XII. p. 673 (1862).

Cape York, Rockhampton, Sydney, Adelaide.

335 NIGRICEPS (*Formica*), Sm. Brit. Mus. Cat. Hym. p. 38 (1858);
Camponotus intrepidus, Mayr, Verh. z.-b. Gesell. XII.
(1862); *Camponotus dimidiatus*, Rog. Verz. d. Form.
p. 4 (1863).

Rockhampton, &c., N.Q. ; Sydney, N.S.W.

NIGROÆNEUS, Mayr, Verh. z.-b. Gesell. XII. p. 663 (1862);
Sm. Brit. Mus. Cat. Hym. p. 40 (1858).
New Holland.

NOVÆ-HOLLANDIÆ, Mayr, Verh. z.-b. Gesell. XX. p. 939
(1870).

Cape York, Q.

NIGRIVENTRIS (*Formica*), Guér. Voy. d. Coq. Zool. II. p. 203,
Atlas pl. VIII. fig. 4, 4a.
Sydney, N.S.W.

PURPUREUS, Mayr, Journ. Mus. Godef. XII. p. 62 (1876).
Rockhampton, Q.

340 RUBGINOSUS, Mayr, l.c. p. 66.
Peak Downs, Q.

SCHENCKI, Mayr, Verh. z.-b. Gesell. XII. p. 674 (1862).
Sydney, N.S.W. ; Rockhampton, Q.

SIMILIS, Mayr, Journ. Mus. Godef. XII. p. 61 (1876).
Rockhampton, Q.

SPLENDIDUS, Mayr, l.c. p. 61.
Peak Downs, Q.

SUBNITIDUS, Mayr, l.c. p. 65.
Peak Downs, Q.

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- 345 *TESTACEIPES* (*Formica*), Sm. Brit. Mus. Cat. Hym. p. 30 (1858);
Mayr, Verh. z.-b. Gesell. XII. 662 (1862); *Formica*,
terebrans, Lowne, Entomol. II. p. 278 (1865).

Sydney, N.S.W.

88. *COLOBOPSIS*.

Colobopsis, Mayr, Europ. Form. (1861).

- MUTILATA* (*Formica*), Sm. Jour. Proc. Linn. Soc. III. p. 137
(1859); Mayr, Verh. z.-b. Gesell. XII. p. 691 (1862);
Ibid. XIII. p. 403 (1863); Rog. Verz. d. Form. p. 10.

Sydney, N.S.W.; Aru and N. Guinea.

89. *POLYRHACHIS*.

Polyrhachis, Shuckard, Hist. Ins. (1840).

- AMMON* (*Formica*), Fabr. Ent. Syst. II. p. 361; Mayr, Mus.
Godef. XII. p. 72 (1876).

Rockhampton and Peak Downs, Q.

- AMMONOEIDES*, Rog. Berl. Ent. Zeit. VII. p. 157 (1863).

Sydney, N.S.W.

- AUSTRALIS*, Mayr, Verh. z. b. Gesell. XX. p. 945 (1870).

Mackay, Q.

- 350 *DAEMELI*, Mayr, Journ. Mus. Godef. XII. p. 72 (1876).

Rockhampton, Q.

- FEMORATUS*, Sm. Brit. Mus. Cat. Hym. p. 73 (1858).

Melbourne, Vic.; Rockhampton, Q.

- GUERINI*, Rog. Berl. Ent. Zeit. VII. p. 157 (1863); var. *aurea*,

Mayr, l.c. p. 74; var. *vermiculosa*, l.c. p. 74; var.

pullescens, l.c. p. 74.

Sydney, N.S.W.; Rockhampton, Q.

- GRISEUS* (*Formica*), Le Guillou, Ann. Soc. Ent. France, X
p. 314.

Australia

- HEXACANTHUS* (*Formica*), Erichs. Wieg. Arch. VIII. p. 260,
No. 231 (1842); *Polyrhachis fuscipes*, Mayr, Verh. z.-b.
Gesell. XII. p. 679 (1862); *Polyrhachis jacksoniana*,
Rog. Berl. Ent. Zeit. VII. p. 158 (1863)

Sydney, N.S.W.

355 HOOKERI, Lowne, Ent. II. p. 334.

Sydney, N.S.W.

HIRSUTA, Mayr, Journ. Mus. Godef. XII. p. 75 (1876).

Rockhampton, Q.

LÆVIOR, Rog. Verz. d. Form. p. 8, 232; *Polyrhachis lævissimus*,
Sm. Journ. Proc. Linn. Soc. III. p. 141 (1859);
Polyrhachis australis, Mayr, Verh. z.-b. Gesell. XX.
p. 945 (1870).

N. Queensland.

LATREILLEI, Guér. Voy. de Coq. Zool. II. p. 205; *Formica*
ammon, Latr. Hist. Nat. (1802).

Australia.

MICANS, Mayr, Journ. Mus. Godef. XII. p. 76 (1876).

Rockhampton, Q.

360 ORNATA, Mayr, l.c. p. 73.

Rockhampton, Q.

PUNCTIVENTRIS, Mayr, l.c. p. 73.

Rockhampton, Q.

RASTELLATUS (*Formica*), Latr. Nat. Hist. Fourm. p. 130
(1802); Mayr, Verh. z.-b. Gesell. XII. p. 688 (1862);
Mayr, Adn. in Mon. Form. Indo-Neerl. p. 41 (1867);
Mayr, Journ. Mus. Godef. XII. p. 70.

Australia; Rockhampton, Peak Downs, Q.

RELUCENS (*Formica*), Latr. Hist. Nat. Fourm. p. 113, pl. iv.
fig. 24; Sm. Journ. Proc. Linn. Soc. II. p. 59 (1857)
Mayr, Adn. in Mon. Form. Ind.-Neerl. p. 23 (1867).

Cape York, N.A.; Java, Borneo, &c.

SEMI-AURATA, Mayr, Journ. Mus. Godef. XII. p. 70 (1876).

Sydney, N.S.W.

365 SIDNICA, Mayr, Verh. z.-b. Gesell. Wien, XVI. p. 886
(1866); *quadricuspis*, Mayr, Neue Form. Verh. z.-b.
Gesell. XX. p. 946 (1870).

Rockhampton, Q.

TRAPEZOIDEA, Mayr, Journ. Mus. Godef. XII. p. 71 (1876).

Rockhampton, Q.

90. MYRMECOPSIS.

Myrmecopsis, Sm. Journ. Linn. Soc. VIII. (1865).

RESPICIENS (*Formica*), Sm. Journ. Linn. Soc. VIII. p. 68,
pl. iv. fig. 3 (1865).

Rockhampton, Q. ; Sydney, N.S.W. ; N. Guinea, &c.

91. LEPTOMYRMEX.

Leptomyrmex, Mayr, Myrm. Stud. (1862).

ERYTHROCEPHALUS (*Formica*), Fabr. Ent. Syst. II. p. 351 ;
Atta erythrocephala, Fabr. Syst. Piez. p. 423 ; *Leptomyr-*
mex erythrocephalus, Mayr, Verh. z.-b. Gesell. XII.
p. 696 ; *Formica nigriventris*, Guér. Voy. Coq. Zool. II.
p. 203.

Rockhampton, and Gayndah, Q. ; Sydney, N.S.W.

92. PRENOLEPIS.

Prenolepis, Mayr, Europ. Form. p. 52 (1861).

BRAUERI, Mayr, Reise Novara, Form. p. 49.
Australia.

370 OBSCURA, Mayr, Verh. z.-b. Gesell. XII. p. 698 ; Reise
Novara, Form. p. 52.

Rockhampton, Q.

VIVIDULA (*Formica*), Nyl. Adn. Mon. Form. p. 900 ; Mayr,
Form. Ind. Syn. p. 67 ; Verh. z.-b. Gesell. XX. p. 949 ;
Tapinoma vividula, Sm. Brit. Mus. Cat. Hym. p. 56 ;
Rog. Verz. d. Form. p. 13 ; *Formica perminuta*, *picea*
and *terricola*, Buckley, Proc. Ent. Soc. Philad. pp. 162,
163, 168 (1866).

Sydney, N.S.W.

93. CATAGLYPHIS.

Cataglyphis, Foerster, Ver. d. Nat. Rheinl. (1850).

ÆNEOVIRENS (*Formica*), Lowne, Entomol. II. p. 276 ; Mayr,
Journ. Mus. Godef. XII. p. 78 (1876).

Sydney, N.S.W. ; Peak Downs, Q.

94. HYPOCLINEA.

Hypoclinea, Mayr, Form. Aust. p. 105 (1855).

GRACILIS (*Formica*), Lowne, Entomol. II. p. 280; Mayr, Verh. z.-b. Gesell. XX. p. 959; Mus. Godef. XII. p. 82 (1876).
Sydney, N.S.W.; Rockhampton, Q.

RUFONIGRA (*Formica*), Lowne, Ent. II. p. 279; Mayr, Verh. z.-b. Gesell. XX. p. 959; Mus. Godef. XII. p. 82 (1876);
Acantholepis mamillatus, Lowne, Ent. II. p. 333; *Hypoclinea mamillata*, Mayr, Verh. z.-b. Gesell. XX. p. 959.
Sydney, N.S.W.; Rockhampton, Q.; Samoa, &c.

95. TAPINOMA.

Tapinoma, Foerster, Stud. Hym. p. 43 (1850).

375 ALBIPES (*Formica*), Sm. Journ. Linn. Soc. VI. p. 38 (1861);
Tapinoma nigrum, Mayr, Verh. z.-b. Gesell. XII. p. 703;
Reise Novara, Form. p. 62.
Australia.

MINUTUM, Mayr, Verh. z.-b. Gesell. XII. p. 703; Reise
Novara, Form. p. 62.
Sydney, N.S.W.

PUSILLUM, Mayr, Journ. Mus. Godef. XII. p. 83 (1876).
Rockhampton, Q.; Sydney, N.S.W.

96. DIACAMMA.

Diacamma, Mayr, Myrm. Stud. p. 718 (1862)

AUSTRALE (*Formica*), Fabr. Syst. Ent. p. 359; Rog. Verz.
Form. No. 487; Mayr, Mus. Godef. XII. p. 87 (1876);
Ponera australis, Rog. Berl. Ent. Zeit. 1860, p. 303.
Rockhampton, Q.

Sub-Family PONERINÆ.

97. ODONTOMACHUS.

Odontomachus, Latreille, Hist. Crust. et Ins. XIII. p. 257.

ANGULATUS, Mayr, Myrm. Beitr. p. 17 (1866); Journ. Mus.
Godef. XII. p. 86 (1876); *Odontomachus animosus*, Sm.
Journ. Linn. Soc. V. p. 102 (1860).
Cape York, N.A.

730 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA,

380 COBIARIUS, Mayr, Journ. Mus. Godef. XII. p. 85 (1876);
var. *semicircularis*, l.c. p. 85; var. *magnus*, l.c. p. 85.

Rockhampton, Peak Downs, and Gayndah, Q.

HÆMATODES, Linné; Mayr, Journ. Mus. Godef. XII. p. 85
(1876).

Australia, Tonga, &c.

RUFICEPS, Sm. Brit. Mus. Cat. Hym. p. 81 (1858).

Australia.

98. PONERA.

Ponera, Latreille, Hist. Crust. et Ina. IV. p. 128.

AUSTRALIS (*Formica*), Fabr. Syst. Ent. p. 393, pl. xvi.; Ent.
Syst. II. p. 359, No. 41; Syst. Piez. p. 410, No. 59;
Oliv. Enc. Méth. VI. p. 497, No. 33; Latr. Hist. Nat.
Fourm. p. 128.

Australia.

LUTEA, Mayr, Verh. z.-b. Gesell. XII. p. 721; Reise Novara,
Form. p. 66; Journ. Mus. Godef. XII. p. 88 (1876).

Sydney, N.S.W.; Rockhampton and Gayndah, Q.

385 METALLICA, Sm. Brit. Mus. Cat. Hym. p. 94, pl. vi. figs. 17,
18 (1858).

Adelaide, S.A.

OCULATA, Sm. Brit. Mus. Cat. Hym. p. 93 (1858).

Macintyre River, Australia.

RUGINODA, Sm. l.c. p. 93.

Australia.

99. BOTHROPONERA.

Bothroponera, Mayr. Myrm. Stud. p. 717.

PILIVENTRIS (*Pachycondyla*), Sm. Brit. Mus. Cat. Hym. p. 107
(1858); Mayr, Journ. Mus. Godef. XII. p. 87 (1876).

Peak Downs, Rockhampton, and Brisbane, Q.

100. ANOCHETUS.

Anochetus, Mayr, Europ. Form. p. 53.

RECTANGULARIS, Mayr, Journ. Mus. Godef. XII. p. 86 (1876).

Rockhampton, Q.

101. ECTATOMMA.

Ectatomma, Sm. Brit. Mus. Cat. (1858).

390 ACICULATUM, Sm. Brit. Mus. Cat. Hym. p. 104 (1858).

Hunter River, N.S.W.

ARANEOIDES (*Ponera*), Le Guillou, Ann. Soc. Ent. France X.
p. 317 (1841); *Ectatomma rugosa*, Sm. Proc. Linn.
Soc. III. p. 143 (1859); Mayr, Journ. Mus. Godef.
XII. p. 92.

Cape York, N.A.; Aru I. and Ceram.

AURATUM, Rog. Berl. Ent. Zeit. 1861, p. 169.

Cape York, N.A.

CRISTATUM, Mayr, Journ. Mus. Godef. XII. p. 91 (1876).

Gayndah, Q.

CONVEXUM, Mayr, l.c. p. 92.

Rockhampton, Q.

395 IMPRESSUM, Mayr, l.c. p. 92.

Gayndah, Q.

METALLICUM, Sm. Brit. Mus. Cat. Hym. p. 94 (1858); Mayr,
Verh. z.-b. Gesell. XVI. p. 891 (1866).

Australia.

NUDATUM, Mayr, Journ. Mus. Godef. XII. p. 91 (1876).

Gayndah, Q.

PUNCTATUM, Sm. Brit. Mus. Cat. Hym. p. 104 (1858).

Port Lincoln, S.A.

SCABRUM, Mayr, Journ. Mus. Godef. XII. p. 90 (1876).

Mackay, Rockhampton, &c., Q.

400 SOCIALE, Macleay, Trans. Ent. Soc. N.S.W. II. p. 369 (1873).
N.S. Wales.

102. LOBOPELTA.

Lobopelta, Mayr, Myrm. Stud. p. 733.

CONIGERA, Mayr, Journ. Mus. Godef. XII. p. 89 (1876).

Peak Downs and Rockhampton, Q.

EXCISA, Mayr, l.c. p. 89.

Rockhampton, Q.

FALLAX, Mayr, l.c. p. 88.

N. Queensland.

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103. PACHYCONDYLA.

Pachycondyla, Sm. Brit. Mus. Cat. Hym. (1858).

ASTUTA, Sm. Brit. Mus. Cat. Hym. p. 107 (1858).

Australia.

405 BISPINOSA, Sm. l.c. p. 107.

Australia?

104. IRIDOMYRMEX.

Iridomyrmex, Mayr, Myrm. Stud. p. 702.

PURPUREUS (*Formica*), Sm. Brit. Mus. Cat. Hym. p. 40 (1858); Mayr, Verh. z.-b. Gesell. XII. p. 703.

Australia.

105. AMBLYOPONE.

Amblyopone, Erichs. Wieg. Archiv, 1842.

AUSTRALIS, Erichs. Wieg. Arch. VIII. p. 261, No. 232 (1842); Sm. Brit. Mus. Cat. Hym. p. 109, pl. VII. figs. 21-4 (1858).

Australia.

FERRUGINEA, Sm. Brit. Mus. Cat. Hym. p. 110 (1858).

Melbourne, Vic.

OBSCURA, Sm. l.c. p. 109.

Australia.

Sub-Family MYRMECINÆ.

106. MYRMICA.

Myrmica, Ltr. Hist. Crus. Ins. XIII. p. 258.

410 ADELAIDÆ, Sm. Brit. Mus. Cat. Hym. p. 128 (1858).

Adelaide, S.A.

FORMOSA, Sm. Brit. Mus. Cat. Hym. p. 128 (1858).

Adelaide, S.A.

LONGICEPS, Sm. Brit. Mus. Cat. Hym. p. 128 (1858).

Melbourne, Vic.

MOLESTA, Say, Bost. Jour. Nat. Hist. I. p. 293, No. 6; Sm. l.c. pp. 122, 130; *Myrmica domestica*, Shuck. Mag. Nat. Hist. p. 628 (1838), Curtis, Trans. Linn. Soc. XXI. p. 217, No. 13; Nyl. Form. France et d'Algér. p. 98, No. 26; *Myrmica pharaonis*, Rog. Berl. Ent. Zeit. (1862); Mayr, Verh. z.-b. Gesell. XII. p. 752; Linn. Syst. Nat. II. p. 963, No. 8 (?).

Australia (and most parts of the world).

107. MYRMECIA.

Myrmecia, Fabr. Syst. Piez. p. 423.

AFFINIS, Mayr, Verh. z.-b. Gesell. XII. p. 725.

Australia.

415 ANALIS, Mayr, l.c. p. 728.

Australia.

AURIVENTRIS, Mayr, Verh. z.-b. Gesell. Wien, XX. p. 968
(1870); Journ. Mus. Godef. XII. p. 95 (1876).

N.S. Wales, Tasmania.

CRUDELIS, Sm. Brit. Mus. Cat. Hym. p. 147 (1858).

Adelaide, S.A.

ESURIENS, Fabr. Syst. Piez. p. 424; Mayr, Mus. Godef. XII.
p. 94 (1876); *Myrmecia Tasmaniensis*, Sm. Brit. Mus.
Cat. Hym. p. 147 (1858).

Tasmania.

FORFICATA, Fabr. Syst. Piez. p. 424, No. 3; Cab. Banks,
Mus. Linn. Soc.; *Formica forficata*, Fabr. Ent. Syst. II.
p. 363, No. 56; Oliv. Enc. Méth. VI. p. 501, No. 51;
Myrmecia simillima, Sm. Brit. Mus. Cat. Hym. p. 144
(1858).

Tasmania.

420 GULOSA (*Formica*), Fabr. Syst. Ent. p. 395; Spec. Ins. I.
p. 494, No. 34; Ent. Syst. II. p. 363, No. 55; Fabr.
Syst. Piez. p. 424, No. 2; Guér. Voy. d. Coq. II. 206;
Mayr, Journ. Mus. Godef. XII. p. 95 (1876).

Sydney, N.S.W.; Brisbane and Rockhampton, Q.

MANDIBULARIS, Sm. l.c. p. 145.

Adelaide, S.A.

NIGRICEPS, Mayr, Verh. z.-b. Gesell. XII. p. 725; Mus.
Godef. XII. p. 95 (1876).

Adelaide, Sydney, Rockhampton, &c.

NIGRISCAPA, Rog. Berl. Ent. Zeit. 1861, p. 33.

N.S. Wales.

NIGRIVENTRIS, Mayr, Verh. z.-b. Gesell. XII. p. 724; *Myr-
mecia forceps*, Rog. Berl. Ent. Zeit. 1861, p. 34.

Australia.

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425 NIGROCINCTA, Sm. Brit. Mus. Cat. Hym. p. 147 (1858);
Mayr, Journ. Mus. Godef. XII. p. 95 (1876).

Sydney, N.S.W.; Peak Downs, Q.

PICTA, Mayr, l.c. p. 94; Sm. l.c. p. 146; *Myrmecia urens*,
Lowne, Ent. II. p. 336 (1865); *Myrmecia pumilio*,
Mayr, Verh. z.-b. Gesell. Wien, XVI. p. 896 (1866).

Sydney, Adelaide and Queensland.

PILIVENTRIS, Sm. Brit. Mus. Cat. Hym. p. 146 (1858);
Mayr, Journ. Mus. Godef. XII. p. 93 (1876).

Sydney, N.S.W.; Queensland.

PILOSULA, Sm. Brit. Mus. Cat. Hym. p. 146 (1858); Mayr,
Journ. Mus. Godef. XII. p. 93 (1876); *Formica forst-*
cata, Latr. Hist. d. Fourm. p. 216.

Tasmania, to Cape York, N.A.

PYRIFORMIS, Sm. l.c. p. 144, pl. x. figs. 1-6; Mayr, l.c. p. 96.
Melbourne, Vic., Hunter River, N.S.W.

430 RUFINODIS, Sm. l.c. p. 145.

Adelaide, S.A.

SANGUINEA, Sm. Brit. Mus. Cat. Hym. p. 148 (1858); Mayr,
Journ. Mus. Godef. XII. p. 94.

N S. Wales, Tasmania.

SPADICEA, Mayr, Verh. z.-b. Gesell. XII. p. 724.

Adelaide, S.A.; Sydney, N.S.W.

TARSATA, Sm. l.c. p. 145; Mayr, Journ. Mus. Godef. XII.
p. 96 (1876).

Sydney, N.S.W., Peak Downs, Q.

TRICOLOR, Mayr, Verh. z.-b. Gesell. XII. p. 724; Reise
Novara, Form. p. 85; Journ. Mus. Godef. XII. p. 96
(1876).

Sydney, N.S.W.; Peak Downs, Q.

435 VARIANS, Mayr, Journ. Mus. Godef. l.c. p. 94.

Rockhampton, Peak Downs, Q.

VINDEX, Sm. l.c. p. 144.

W. Australia.

108. CREMASTOGASTER.

Cremastogaster, Lund, Ann. Sc. Nat. XXIII. (1831).

AUSTRALIS, Mayr, Journ. Mus. Godef. XII. p. 108 (1876).

Peak Downs, Q.

FUSCA, Mayr, l.c. p. 107.

Rockhampton, Q.

LÆVICEPS, Sm. Brit. Mus. Cat. Hym. p. 138 (1858); Mayr, Journ. Mus. Godef. XII. p. 107.

Cape York, Rockhampton, Sydney, and Melbourne.

440 PALLIPES, Mayr, Verh. z.-b. Gesell. XII. p. 768; Reise Novara, Form. p. 107; Journ. Mus. Godef. l.c. p. 108;

Cremastogaster piceus, Lowne, Entomologist II. p. 335.

Sydney, N.S.W.

BUFO-TESTACEA, Mayr, Journ. Mus. Godef. l.c. p. 109.

Sydney, N.S.W.

109. APHÆNOGASTER.

Aphænogaster, Mayr, Verh. z.-b. Ver. Wien, III. (1853).

LONGICEPS (*Myrmica*), Sm. Brit. Mus. Cat. Hym. p. 128 (1858); Mayr, Journ. Godef. XII. p. 98.

Gayndah, Peak Downs, and Rockhampton, Queensland; Sydney, N.S.W.

110. TETRAMORIUM.

Tetramorium, Mayr, Form. Aust. (1855).

GUINEENSE (*Formica*), Fabr. Syst. Entomol. ii. p. 357, No. 31; Mayr, Verh. z.-b. Gesell. XIII. p. 456; Journ. Mus. Godef. XII. p. 99 (1863).

Gayndah, Rockhampton, &c., Q.

111. MONOMORIUM.

Monomorium, Mayr, Form. Aust. (1855).

LÆVE, Mayr, Journ. Mus. Godef. XII. p. 101 (1876).

Rockhampton, Q.

445 PHARAONIS, Linné, Mayr, l.c. p. 100.

Rockhampton and Sydney.

RUBRICEPS, Mayr, l.c. p. 101.

Rockhampton and Cape York, Q.; Sydney, N.S.W.

112. ATTA.

Atta, St. Fargeau, Hym. I. (1836).

ANTIPODUM, Sm. Brit. Mus. Cat. Hym. p. 166 (1858).

Swan River, W.A.

SPINODA, Sm. l.c. p. 166.

Adelaide, S.A.

VIGILANS, Sm. l.c. p. 166.

Melbourne, Vic.

113. PHEIDOLE.

Pheidole, Westw. Ann. & Mag. Nat. Hist. VI. (1841).

450 BREVICORNIS, Mayr, Journ. Mus. Godef. XII. p. 106 (1876).

Rockhampton, Q.

IMPRESSICEPS, Mayr, l.c. p. 105.

Rockhampton, Q.

OPACIVENTRIS, Mayr, l.c. p. 105.

Rockhampton, Q.

PROXIMA, Mayr, l.c. p. 104.

Peak Downs, Q.

TASMANIENSIS, Mayr, Myrm. Beitr. p. 28 (1866); Mayr,
Journ. Mus. Godef. XII. p. 106

Tasmania.

455 VARIABILIS, Mayr, Journ. Mus. Godef. l.c. p. 103.

Rockhampton, Q.

114. PODOMYRMA.

Podomyrma, Sm. Journ. Linn. Soc. III. (1859).

FEMORATA, Sm. Journ. Linn. Soc. III. p. 145 (1859); Mayr,
Journ. Mus. Godef. XII. p. 110.

Cape York, N.Q.

GRATIOHA (*Myrmecina*), Sm. Brit. Mus. Cat. Hym. p. 133
(1858); Mayr, l.c. p. 100.

Sydney, N.S.W.; Cape York, N.Q.; Adelaide, S.A.

INERMIS, Mayr, Journ. Mus. Godef. XII. p. 111 (1876).

Peak Downs, Q.

MICANS, Mayr, l.c. p. 111.

Rockhampton, Q.

115. SIMA.

Sima, Rog. Berl. Ent. Zeit. 1863.

- 460 LÆVICEPS (*Pseudomyrma*), Sm. Journ. Proc. Linn. Soc. III.
p. 145 (1859); Mayr, l.c. p. 111.
Rockhampton and Port Darwin, Q.; N. Guinea, &c.

116. MERANOPLUS.

Meranoplus, Sm. Trans. Ent. Soc. 1853.

DIMIDIATUS, Sm. Trans. Ent. Soc. (3) V. p. 527, pl. xxvi.
f. 8 (1865-7).

Champion Bay, W.A.

DIVERSUS, Sm. l.c. p. 527, pl. xxvi. f. 2.

Champion Bay. W.A.

FENESTRATUS, Sm. l.c. p. 526, pl. xxvi. f. 6.

Champion Bay, W.A.

HIRSUTUS, Mayr, Journ. Mus. Godef. XII p. 112 (1876).

Rockhampton, Port Darwin, Q.; Sydney, N.S.W.; Adelaide, S.A.; Champion Bay, W.A.

- 465 PUBESCENS (*Cryptocerus*), Sm. Trans. Ent. Soc. 1853, p. 223,
pl. xx. fig. 4; Trans. Ent. Soc. 1862, p. 413; Mayr,
Journ. Mus. Godef. XII. p. 112; *Meranoplus fenestratus*,
Sm. Trans. Ent. Soc. 1867, p. 526, pl. xxvi. fig. 6.
All parts of Australia.

Family MUTILLIDÆ.

This family contains a number of insects with which the following family (*Thynnidæ*) were at one time placed. They are plentiful in India, Africa, and are generally distributed over the warmer portions of the globe. All our Australian species belong to the genus *Mutilla*, Linn.; and several species are plentiful about Sydney. The females are wingless, and from their habits of running about on the sand or tree stems, and hiding under stones, are popularly known as "solitary ants," to which group of

the Hymenoptera they are closely allied, and coming between *Formicidae* and *Scoliididae* seem to form a connecting link between the ants and the latter group of fossorial wasps. Little or nothing has been observed about the habits of our Australian species, but it is most likely that both *Mutilla* and *Thynnus* store their nests with other insects for the larvæ to feed upon like the winged females of the *Sphegidae*, &c., as European species have been dug out of the sand in chambers containing the remains of other insects. The first species recorded from Australia were described from the Banksian Museum by Fabricius (Ent. Syst. 1775). In Westwood's "Arcana Entomologica" (1842) the previously described ones were redescribed, figured, and a number of new species added. In the British Museum Catalogue of Hymenoptera (1855), Smith gave a list of all the described species, and supplemented it with twenty-four new species; since his Catalogue he has added a number of new species chiefly from Western Australia in his "Descriptions of New Species of Hymenoptera in the British Museum" (1879). In 1883 Kohl described two more in the Verb. Gesell. z.-b. Wien, XXXII.

117. MUTILLA.

Mutilla, Linn. Syst. Nat. ed. x. (1758).

ABDOMINALIS, Westw. Arc. Ent. II. p. 19, pl. LIII. fig. 1, ♂.
N.S. Wales.

AFFINIS, Westw. l.c. p. 18, pl. LIV. fig. 2, ♀.
Australia.

ACICULATA, Kohl, Verh. z.-b. Gesell. Wien, XXXII. p. 477,
pl. XXIII. figs. 4 and 19 (1883).
Australia.

ÆRUGINOSA, Sm. New Sp. Hym. Brit. Mus. p. 207, ♂ (1879).
Moreton Bay, Q.

470 APICALIS, Sm. Brit. Mus. Cat. Hym. p. 23, ♂ (1855).
N.S. Wales.

ALBOLINEATA, Sm. New Sp. Hym. Brit. Mus. p. 205, ♀ (1879).
Champion Bay, W.A.

AURATA, Fabr. Ent. Syst. II. p. 368, No. 8, ♀; Syst. Piez. p. 430, No. 9; Oliv. Enc. Méth. VIII. p. 56, No. 10; Westw. Arc. Ent. II. p. 18.

Australia.

AURICEPS, Sm. New Sp. Hym. Brit. Mus. p. 201, ♀ (1879).

Australia.

AUSTRALASIÆ, Fabr. Syst. Piez. 433, 25, ♀; Oliv. Enc. Méth. VIII. 62, 41; Westw. Arc. Ent. II. p. 18.

Australia.

475 AUROPILOSA, Sm. New Sp. Hym. Brit. Mus. p. 203, ♀ (1879).
Champion Bay, W.A.

BICOLORATA, Sm. l.c. p. 207, ♀.

Victoria.

BIPARTITA, Sm. l.c. p. 205, ♀.

Champion Bay, W.A.

CARBONARIA, Sm. Brit. Mus. Cat. Hym. p. 30, ♂ (1855).

Tasmania.

CONCINNA, Westw. Arc. Ent. II. p. 19, pl. LIII. fig. 3, ♀.

Tasmania.

480 CORDATA, Sm. Brit. Mus. Cat. Hym. p. 28, ♀ (1855).

Sydney, N.S.W.; Adelaide, S.A.

DISTINGUENDA, Sm. l.c. p. 25, ♀.

West Australia.

DEPRESSA, Sm. New Sp. Hym. Brit. Mus. p. 203, ♀ (1879).

Champion Bay, W.A.

DORSIGERA, Westw. Arc. Ent. II. p. 18, pl. LIII. fig. 4, ♀.

Tasmania.

ELEGANS, Westw. l.c. p. 19, pl. LIII. fig. 2, ♂.

Tasmania.

485 FORMICARIA, Fabr. Ent. Syst. II. 368, 6; Syst. Piez. ♀; Oliv.

Enc. Méth. VIII. 56, 9; Westw. l.c. p. 17, pl. LIII. fig. 6.

Australia.

FRAGILIS, Sm. New Sp. Hym. Brit. Mus. p. 203, ♂ (1879).

Champion Bay, W.A.

740 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA,

HOSPES, Sm. l.c. p. 202, ♀.

Champion Bay, W.A.

IGNITA, Sm. Brit. Mus. Cat. Hym. p. 24, ♀ (1855).

Australia.

INSTABILIS, Sm. l.c. p. 27, ♀.

King George's Sound, W.A.

490 JUCUNDA, Sm. New Sp. Hym. Brit. Mus. p. 203, ♀ (1879).

Adelaide, S.A.

LACINIA, Sm. Brit. Mus. Cat. Hym. p. 25, ♂ (1855).

N.W. Coast, Australia.

LATERALIS, Westw. Arc. Ent. II. p. 18, pl. liv. fig. 3, ♀.

Tasmania.

LUTARIA, Sm. Brit. Mus. Cat. Hym. p. 27, ♀ (1855).

Swan River, W.A.

MACULATA, Sm. l.c. p. 28, ♀.

Adelaide, S.A.

495 METALLICA, Sm. l.c. p. 28, ♀.

Adelaide, S.A.

MODESTA, Sm. l.c. p. 29, ♀.

Adelaide, S.A.

MOROSA, Westw. Arc. Ent. II. p. 19, pl. liv. fig. 1, ♂

Swan River, W.A.

NEPHELOPTERA, Kohl, Verh. z.-b. Gesell. Wien, XXXII.

p. 485 (1883).

N. Australia.

NIGROÆNEA, Sm. Brit. Mus. Cat. Hym. p. 24, ♀ (1855).

Australia.

500 NITIDA, Sm. New Sp. Hym. Brit. Mus. p. 205, ♀ (1879).

Champion Bay, W.A.

NOTABILIS, Sm. l.c. p. 204, ♀.

Tasmania.

OLIVIERI (*Myrmecodes*), St. Farg. Hym. III. p. 588, ♀ (1845),

Myzine aptera, Oliv. Enc. Méth. VIII. p. 137.

Australia.

PACIFICATRIX, Sm. New Sp. Hym. Brit. Mus. p. 204, ♀ (1879).
Champion Bay, W.A.

PALLIDICORNIS, Sm. l.c. p. 202, ♀.
N. S. Wales.

505 PEDESTRES (*Myrmecodes*), Latr. Crus. et Ins. IV. p. 118 ; St.
Farg. Hym. III. p. 587, ♀ ; *Tiphia pedestres*, Fabr. Syst.
Piez. p. 235, ♀.
Australia.

PERPLEXA, Sm. Brit. Mus. Cat. Hym. p. 26, ♀ (1855).
N.W. Coast, Australia.

PULCHELLA, Sm. l.c. p. 29, ♀.
Moreton Bay, Q. ; Adelaide, S.A.

QUADRATA, Sm. l.c. p. 29, ♀.
Adelaide, S.A.

QUADRICEPS, Sm. New Sp. Hym. Brit. Mus. p. 206, ♀ (1879).
Adelaide, S.A.

510 ROBUSTA, Sm. Brit. Mus. Cat. Hym. p. 24, ♂ (1855).
Australia.

RUBELLA, Sm. l.c. p. 26, ♀.
N.W. Coast, Australia.

RUFICORNIS, Fabr. Ent. Syst. II. p. 369 ; Syst. Piez. p. 431 ;
Oliv. Enc. Méth. VIII. p. 59 ; Westw. Arc. Ent. II.
p. 18.
Australia.

RUGICOLLIS, Westw. l.c. p. 17, pl. LIII. fig. 5, ♀.
Hunter River, N.S.W.

SCABROSA, Sm. New Sp. Hym. Brit. Mus. p. 202, ♀ (1879).
Swan River, W.A.

515 SCRUTATA, Sm. l.c. p. 206, ♀.
Melbourne, Vic.

SPLENDIDA, Sm. l.c. p. 207, ♂.
N. Guinea, N. Australia?

STRIGOSA, Sm. Brit. Mus. Cat. Hym. p. 27, ♀ (1855).
Swan River, W.A.

742 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA

VENUSTA, Sm. l.c. p. 26, ♀.

Perth, W.A.

VIRIDATIS, Sm. l.c. p. 25, ♂.

Australia

520 VIVIDA, Sm. New Sp. Hym. Brit. Mus. p. 207, ♂ (1879).

Champion Bay, W.A.

Family THYNNIDÆ.

This group is a very characteristic one among our Australian Hymenoptera, and the genus *Thynnus*, which is peculiar to America and Australasia, is remarkable for the number and beauty of its species. In the early summer, in a favourable locality, scores of the males of *T. variabilis*, Kirby, *T. leachiellus*, Westw., and *T. shuckardi*, Guér., three of our commonest species, may be seen hovering over the flowers, and seeking the small wingless females. Many of the early entomologists described the sexes as different species, and in this family, and also in the *Mutillidæ*, it is very difficult to sex any of the species unless they are captured together. As many of the following species have been described from specimens of the one sex, there is, no doubt, a good deal of confusion in this family, and a revision of the *Thynnidæ* would be very useful work. Fabricius formed the genus *Thynnus* in his "Syst. Entomologica" (1775). M. Guérin in his Memoir of the *Thynnidæ* in the "Voyage de la Coquille" (1830), and afterwards in the "Magasin de Zoologie" (1842), described a large number of new species, and divided them up into a great number of new genera. In 1842, Dr. Klug wrote a monograph of this family in the "Transactions of the Berlin Academy," when he rejected most of Guérin's genera, and, uniting them all under *Thynnus*, described forty new species. Westwood, in his "Arcana Entomologica" (1845), Vol. II., gives a lot of interesting information about this family, and describes a number of new species which he figures. In the "British Museum Catalogue of Hymenoptera" (1859), Smith catalogued all the

previously described species, and described a great many new ones. In his "New Species of Hymenoptera in the British Museum" (1879), the same writer added a great many more new species, most of them from Western Australia.

118. THYNNUS.

Thynnus, Fab. Syst. Ent. p. 360 (1775).

ADUSTUS, Sm. Brit. Mus. Cat. Hym. p. 43, ♀ (1859).
Australia.

AFFINIS, Guér. Voy. de la Coq. Zool. II. p. 226, ♂; Klug,
Berl. Abhandl. p. 18, 7 (1842).
King George's Sound, W.A.

AGILIS, Sm. l.c. p. 20, ♂.
Swan River, W.A.

ALBO-MACULATUS (*Agriomyia*), Sm. l.c. p. 27, ♂.
Adelaide, S.A.

525 ALBO-PICTUS (*Agriomyia*), Sm. l.c. p. 26, ♂.
Swan River, W.A.

ALTERRIMUS, Sm. New Sp. Hym. Brit Mus. p. 164, ♂ (1879).
Swan River, W.A.

ANILITATIS, Sm. Brit. Mus. Cat. Hym. p. 37, ♂ (1859).
Australia.

ANNULATUS, Kirby, Trans. Linn. Soc. XII. p. 476, ♂; Guér.
Voy. Coq. Zool. II. p. 228; Klug. Berl Abhandl. p. 18,
No. 6; *australis*, Boisd. Voy. de l'Astrol. Zool. p. 655,
pl. XII. fig. 2; Guér. l.c. p. 228.
Sydney, N.S.W.

ASSIMILIS, Sm. Brit. Mus. Cat. Hym. p. 20, ♂ (1859).
Swan River, W.A.

530 ATTENUATUS, Sm. l.c. p. 42, ♀.
Australia.

AUDAX, Sm. Trans. Ent. Soc. 1868, p. 234, ♂.
Australia.

744 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA,

AUSTRALIA, Klug, Berl. Abhandl. p. 18, No. 6 (1842);
Myrmecodes australis, Gray, Cuvier's Anim. Kingd.
 (Griffith), nec Boisd. XV. p. 516, pl. LXXI. fig. 3, ♀;
Thynnus Grayii, Guér. Voy. Coq. Zool. II. p. 231;
Thynnus Brownii, Westw. Arc. Ent. II. p. 113, pl. LXXVI.
 fig. 1, ♂.

King George's Sound, W.A.

BACCATUS (*Agriomyia*), Sm. New Sp. Hym. Brit. Mus.
 p. 236, ♂ (1879).

Champion Bay, W.A.

BABALIS (*Thynnoides*), Sm. Brit. Mus. Cat. Hym. p. 23, ♂
 (1859).

Swan River, W.A.

535 BICOLOR (*Entelos*), Westw. Arc. Ent. II. p. 144, pl. LXXXII.
 fig. 4, ♀.

King George's Sound, W.A.

BIDENTATUS (*Agriomyia*), Sm. Brit. Mus. Cat. Hym. p. 32, ♂
 (1859).

Swan River, W.A.

BRENCHLEYI, Sm. Brenchley's Cruise of Curaçoa, p. 156,
 pl. XLIII. fig. 3, ♂.

Champion Bay, W.A.

BREVICORNIS (*Agriomyia*), Sm. Brit. Mus. Cat. Hym. p. 39, ♂
 (1859).

Lower Plenty, Vic.

CALCARATUS (*Agriomyia*) Sm. l.c. p. 40, ♂.

Lower Plenty, Vic.

540 CÆLEBS, Sauss. Reise Novara, Hym. p. 122.

Sydney, N.S.W.

CAMPANULARIS, Sm. Trans. Ent. Soc. 1868, p. 232, ♂.

Champion Bay, W.A.

CARBONARIUS, Sm. Brit. Mus. Cat. Hym. p. 23, ♂ (1859).

Adelaide, S.A.

CERCEROIDES (*Agriomyia*), Sm. l.c. p. 34, ♂.

Australia.

CLYPEARIS, Sauss. Stettiner Ent. Zeit. p. 59, ♂, ♀ (1869).
Sydney, N.S.W.

545 COGNATUS, Sm. Brit. Mus. Cat. Hym. p. 28, ♂ (1859).
Australia.

COLLARIS (*Lophocheilus*), Guér. Mag. Zool. 1842, p. 13.
Australia.

COMBUSTUS (*Agriomyia*), Sm. l.c. p. 32, ♂.
Australia.

COMPRESSUS, Sm. l.c. p. 43, ♀.
Australia.

CONFUSUS, Sm. l.c. p. 13, ♂.
Australia.

550 CONNECTENS, Sm. l.c. p. 45, ♀.
W. Australia.

CONSANGUINEUS (*Agriomyia*), Guér. Mag. Zool. 1842, p. 4.
Australia.

CONSPICUUS, Sm. Trans. Ent. Soc. 1868, p. 231; Brenchley's
Cruise of Curaçoa, p. 459, pl. XLIII. fig. 3, ♂.
Champion Bay, W.A.; S. Australia.

CONSTRICUS, Sm. Brit. Mus. Cat. Hym. p. 19, ♂ (1859).
Swan River, W.A.

CRABRONIFORMIS (*Agriomyia*), Sm. l.c. p. 37, ♂.
Australia.

555 CRASSIPES, Sm. l.c. p. 44, ♀.
Australia.

CRYPTOIDES (*Agriomyia*), Sm. l.c. p. 33, ♂.
Lower Plenty, Vic.

DECORATUS, Sm. New Sp. Hym. Brit. Mus. Cat. p. 159, ♂
(1879).
Adelaide, S.A.

DECEPTOR, Sm. l.c. p. 169, ♂.
Champion Bay, W.A.

DECIPIENS, Westw. Arc. Ent. II. pp. 105, 124, ♂.
Tasmania.

746 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA,

- 560 DENTATUS, Fabr. Syst. Ent. p. 360, ♂; Ent. Syst. II. p. 244; Syst. Piez. p. 231; Latr. Gen. Crus. et Ins. IV. pl. III. fig. 1, and I. pl. XIII. figs. 2, 3, 4, ♂; Enc. Méth. p. 382, fig. 8; Guér. Voy. Coq. Zool. II. p. 222; Klug, Berl. Abhandl. 1842, p. 15, 1; Donovan, Ins. of N. Holland, pl. XLI. fig. 1; Römer, Gen. Ins. t. 35, fig. 8; Lamarck, Anim. sans Vert. t. 4, fig. 109; Sm. Brit. Mus. Cat. Hym. p. 11, ♂ (1859).

Australia.

- DEPRESSUS (*Agriomyia*), Westw. Arc. Ent. II. p. 107, pl. LXXIV. fig. 5, ♂, fig. 6, ♀.

King George's Sound, W.A.

- DILATATUS, Sm. Brit. Mus. Cat. Hym. p. 43, ♀ (1859).

Australia.

- DIMIDIATUS, Westw. Arc. Ent. II. p. 121, pl. LXXVI. fig. 5, ♂.

Australia.

- DISPAR (*Eirone*), Westw. l.c. p. 144, pl. LXXXII. fig. 5, ♂, fig. 6, ♀.

Adelaide, S.A.

- 565 DISTINCTUS (*Lophocheilus*), Guér. Mag. Zool. 1842, p. 12, pl. CIII. figs. 14, 15.

Australia.

- DIVERSUS (*Catocheilus*), Guér. Mag. Zool. 1842; *Catocheilus Klugii*, Guér. Mag. Zool. 1842, pp. 8, 9, pl. CII, figs. 1-14, ♂, ♀.

Swan River, W.A.

- EMARGINATUS, Fabr. Syst. Ent. p. 354, 8, ♀; Ent. Syst. II. p. 228, 19; Syst. Piez. p. 231, 2; Guér. Voy. Coq. Zool. II. p. 229.

Australia.

- EXCELLENS, Sm. New Sp. Hym. Brit. Mus. p. 163, ♂ (1879).

Swan River, W.A.

- FALLAX (*Agriomyia*), Sm. Brit. Mus. Cat. Hym. p. 35, ♂ (1859).

Adelaide, S.A.

570 **FASTUOSUS**, Sm. New Sp. Hym. Brit. Mus. p. 170, ♂ (1879)
Australia.

FENESTRATUS, Sm. Brit. Mus. Cat. Hym. p. 18, ♂ (1859).
Swan River, W.A.

FERVIDUS, Erichs. Wieg. Arch. 1842, p. 263, No. 237, ♀ ;
Westw. Arc. Ent. II. p. 146.
Tasmania.

FERVENS (*Agriomyia*), Sm. Brit. Mus. Cat. Hym. p. 31, ♂
(1859).
Australia.

FIMBRIATUS, Sm. l.c. p. 42, ♀.
Australia.

575 **FLAVILABRIS**, Guér. Mag. Zool. 1842, p. 8, ♂ ; *Thynnus*
morio, Macleay, MS. ?
Australia.

FLAVIPENNIS, Sm. Brit. Mus. Cat. Hym. p. 21, ♂ (1859).
Australia.

FLAVOPICTUS, Sm. l.c. p. 21, ♂.
Australia.

FLAVOFASCIATUS, Sm. l.c. p. 45, ♀.
Swan River, W.A.

FLAVESCENS (*Agriomyia*), Sm. l.c. Appen. p. 68, ♂.
Adelaide, S.A.

580 **FLAVOVARIEGATUS**, Sm. New Sp. Hym. Brit. Mus. p. 170, ♂
(1879).
Australia.

FLAVIVENTRIS, Guér. Voy. Coq. Zool. II. p. 229, ♂ ; Mag.
Zool. 1842, p. 101, fig. 21, ♂ ; Klug, Berl. Abhandl.
1842, p. 19, No. 10.
Australia.

FRAUENFELDIANUS (*Agriomyia*), Sauss. Reise Novara, Hym.
p. 120, ♂.
Sydney, N.S.W.

748 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA,

4-CARINATUS, Sauss. l.c. p. 124, ♀; *Thynnus trisulcatus*, Sm.?
Brit. Mus. Cat. Hym. p. 45 (1859).

Sydney, Australia.

FULVOPILOSDS, Sm. New Sp. Hym. Brit. Mus. p. 160 (1879).
Adelaide, S.A.

585 FULVIPES (*Thynnoides*), Guér. Voy. Coq. Zool. II. p. 233, ♂;
Atlas Ins. pl. VIII. fig. 9; Klug, Berl. Abhandl. p. 22,
No. 16 (1842).

Port Jackson, N.S.W.

FUMIPENNIS (*Thynnoides*), Westw. Arc. Ent. II. p. 108,
pl. LXXV. fig. 1, ♂, fig. 2, ♀.

Melbourne, Vic.

GRACILIS (*Thynnoides*), Westw. l.c. p. 139, pl. LXXXIII.
fig. 2, ♂, fig. 3, ♀.

Adelaide, S.A.

GRAVIDUS, Westw. l.c. p. 141; *Thynnus klugii*? Westw l.c.
p. 140, ♀.

Australia.

GUERINII, Westw l.c. p. 137.

Australia.

590 HUMILIS, Erichs. Wieg. Arch. 1842, p. 264, No. 238, ♀;
Westw. Arc. Ent. II. p. 146.

Tasmania.

HYALINATUS, Westw l.c. p. 106, pl. LXXIV. fig. 3, ♂, fig. 4, ♀.

Tasmania.

ICHNEUMONIFORMIS (*Agriomyia*), Sm. Brit. Mus. Cat. Hym.
p. 39, ♂ (1859).

Lower Plenty, Vic.

IMPATIENS, Sm. New Sp. Hym. Brit. Mus. p. 168 (1879).

Champion Bay, W.A.

IMPETUOSUS, Sm. Trans. Ent. Soc. 1868, p. 233, ♂.

Hunter River, ? N.S.W.; S. Australia.

595 INCENSUS (*Agriomyia*), Sm. New Sp. Hym. Brit. Mus. p. 234,
♂ (1879).

Champion Bay, W.A.

INDISTINCTUS, Sm. l.c. p. 169, ♂.

W. Australia.

INSIDIATOR, Sm. l.c. p. 163, ♂.

Swan River, W.A.

INSIGNIS, Sm. Brit. Mus. Cat. Hym. p. 15, ♂ (1859).

Perth, W.A.

INCONSTANS (*Agriomyia*), Sm. l.c. p. 26, ♂.

Australia.

600 INTRICATUS, Sm. l.c. p. 30, ♂.

Tasmania.

IRIDIPENNIS (*Agriomyia*), Sm. l.c. p. 38, ♂.

Lower Plenty, Vic.

IRRITANS (*Agriomyia*), Sm. New Sp. Hym. Brit. Mus. p. 234,
♂ (1879).

Champion Bay, W.A.

IRREGULARIS, Sm. l.c. p. 162, ♂.

Swan River, W.A.

JUCUNDUS, Sm. Brit. Mus. Cat. Hym. p. 25, ♂ (1859).

Australia.

605 LABIATUS, Klug, Berl. Abhandl. 1842, p. 23, 17, ♂.

Australia.

KLUGII, Westw. Arc. Ent. II. p. 140, pl. LXXXII. fig. 1, ♂.

Swan River, W.A.

LÆVICEPS, Sm. Brit. Mus. Cat. Hym. p. 44, ♀ (1859).

Australia.

LÆVIFRONS, Sm. l.c. p. 45, ♀.

Australia.

LEACHIELLUS, Westw. Arc. Ent. II. p. 135, pl. LXXXIII. fig. 4,
♀ ; *Thynnus interruptus*, Westw. l.c. p. 115, pl. LXXVII.
fig. 1, ♂.

Sydney, N.S.W.

610 LONGICEPS, Sm. Brit. Mus. Cat. Hym. p. 46, ♀ (1859).

Tasmania.

750 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA,

LUCIDUS (*Agriomyia*), Sm. l.c. p. 36, ♂.

Tasmania.

LUCTUOSUS (*Agriomyia*), Sm. l.c. p. 26, ♂.

Australia.

MACULATUS (*Agriomyia*), Guér. Voy. Coq. Zool. II. p. 218 ;
Klug, Berl. Abhandl. 1842, p. 20, No. 12 ; Sauss. Reise
Novara, Hym. p. 116.

Sydney, &c., Tasmania.

MACULOSUS, Sm. l.c. p. 16, ♂.

Australia.

615 MARGINALIS (*Agriomyia*), Westw. Arc. Ent. II. p. 120,
pl. LXXVI. fig. 3. ♂.

King George's Sound, W.A.

MARGINILABRIS (*Agriomyia*), Guér. Mag. Zool. 1842, p. 3,
pl. c. ♂.

Australia.

MAURUS (*Agriomyia*), Sm. Brit. Mus. Cat. Hym. p. 37, ♂
(1859).

Australia.

MEDIUS, Sm. New Sp. Hym. Brit. Mus. p. 170 (1879).

Australia.

MELLEUS (*Agriomyia*), Westw. Arc. Ent. II. p. 118, pl. LXXVI.
fig. 4, ♂ ; Sm. Brit. Mus. Cat. Hym. Append. p. 67, ♀

King George's Sound, W.A. ; Adelaide, S.A.

620 MINUTUS (*Agriomyia*), Sm. Brit. Mus. Cat. Hym. p. 35, ♂.
(1859).

Australia.

MÆSTUS (*Agriomyia*), Sm. l.c. p. 36, ♂.

Melbourne, Vic.

MODESTUS, Sm. l.c. p. 19, ♂.

Swan River, W.A.

MOLESTUS, Sm. New Sp. Hym. Brit. Mus. p. 166, ♂ (1879)

S. Australia.

- MOLITOR, Sm. Brit. Mus. Cat. Hym. p. 43, ♀ (1859) (perhaps ♀ of *klugii*).
S. Australia.
- 625 MONILICORNIS (*Agriomyia*), Sm. l.c. p. 39, ♂.
Lower Plenty, Vic.
- MOROSUS, Sm. New Sp. Hym. Brit. Mus. p. 168, ♂ (1879).
Champion Bay, W.A.
- MULTIPICTUS, Sm. l.c. p. 160, ♂.
Adelaide, S.A.
- NANUS, Sm. l.c. p. 171, ♂.
Tasmania.
- NIGROPICTUS, Sm. l.c. p. 165, ♂.
Swan River, W.A.
- 630 NIGRIPES (*Thynnoides*), Guér. Mag. Zool. 1842, p. 10.
Swan River, W.A.
- NIGER (*Agriomyia*), Sm. Brit. Mus. Cat. Hym. p. 30, ♂ (1859).
Tasmania.
- NITIDUS (*Agriomyia*), Sm. l.c. p. 30, ♂.
Australia.
- NOVARÆ (*Thynnoides*), Sauss. Reise Novara, Hym. p. 119, ♂.
Sydney, N.S.W.
- NUBILIPENNIS, Sm. New Sp. Hym. Brit. Mus. p. 167, ♂ (1879).
Queensland.
- 635 OBLONGUS, Sm. Trans. Ent. Soc. 1868, p. 232, ♂.
Sydney, N.S.W.
- OBSCURIPENNIS, Guér. Voy. Coq. Zool. II. p. 227, ♂; Klug, Berl. Abhandl. 1842, p. 18, 8.
Australia.
- OBSCURUS (*Thynnoides*), Klug, Berl. Abhandl. p. 22, 14, fig. 4, ♂ (1842); Westw. Arc. Ent. II. p. 139, pl. LXXXII. fig. 2, ♂; Sauss. Reise Novara, Hym. p. 122
Sydney, N.S.W.

752 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA,

OCNROCEPHALUS, Sm. Trans. Ent. Soc. 1868, p. 231, ♂.

Champion Bay, W.A.

ODYNEROIDEA, Westw. Arc. Ent. II. p. 109, pl. LXXV. fig. 3, ♂,
fig. 4, ♀.

Australia.

640 *OLIVIERI*, Erichs. Wieg. Arch. 1842, p. 262, No. 235, ♂ ;
Westw. Arc. Ent. II. p. 146.

Tasmania.

OPPOSITUS, Sm. New Sp. Hym. Brit. Mus. p. 162 (1879).

Swan River, W.A.

OPTIMUS, Sm. Brit. Mus. Cat. Hym. p. 29, ♂ (1859).

Swan River, W.A.

PAVIDUS, Sm. New Sp. Hym. Brit. Mus. p. 166, ♂ (1879).

S. Australia.

PEDESTRI (*Tiphia*), Fabr. Syst. Ent. p. 354, 8, ♀ ; Ent. Syst.
II. p. 228, 19 ; Syst. Piez. p. 235, 23 ; Guér. Voy. Coq.
Zool. II. p. 16, 3 ; Klug, Berl. Abhandl. 1842, p. 16, 3 ;
Mutilla myrmecodes, Lamarck, Hist. Nat. (2nd ed.) IV.
p. 316, 7.

Australia.

645 *PENETRANS*, Sm. New Sp. Hym. Brit. Mus. p. 158, ♂ (1879).
Hunter River, N.S.W.

PERELEGANS, Sm. l.c. p. 167, ♂.

Queensland.

PERPLEXUS, Sm. l.c. p. 164, ♂.

Swan River, W.A.

PETIOLATUS (*Agriomyia*), Sm. Brit. Mus. Cat. Hym. p. 36, ♂
(1859).

Hunter River, N.S.W.

PETULANS, Sm. New Sp. Hym. Brit. Mus. p. 164, ♂ (1879)

Swan River, W.A.

650 *PICIPES*, Westw. Arc. Ent. II. p. 114, pl. LXXVII. fig. 2, ♂ ,
Thynnus flavilabris, Guér. Mag. Zool. 1842, p. 81.

King George's Sound, W.A.

PLANIFRONS, Sm. Brit. Mus. Cat. Hym. p. 46, ♀ (1859).
Australia.

PLEBEJUS, Sauss. Reise Novara, Hym. p. 123, ♀.
Australia.

PROPINQUUS, Sm. New Sp. Hym. Brit. Mus. p. 160, ♂ (1879).
Adelaide, S.A.

PROTERVUS, Sm. l.c. p. 159, ♂.
Adelaide, S.A.

655 **PUBESCENS**, Christophori, Mus. Spinola V.; Brullé Hym. III.
p. 569.

PUGIONATUS (*Thynnoides*), Guér. Voy. Coq. Zool. II. p. 234,
♂; Klug, Berl. Abhandl. 1842, p. 23, 19; Sauss. Reise
Novara, Hym. p. 118.
Sydney, N.S.W.

PULCHELLUS (*Agriomyia*), Klug, l.c. p. 20, 13, ♂.
Australia.

PULCHRALIS, Sm. Brit. Mus. Cat. Hym. Appen. p. 68, ♂ (1859).
Adelaide, S.A.

PUNCTATUS, Sm. Brit. Mus. Cat. Hym. p. 44, ♀ (1859).
Australia.

660 **PURPUREIPENNIS**, Westw. Arc. Ent. II. p. 143, pl. LXXXIII.
fig. 1, ♂.
Australia.

QUADRATUS, Sm. Brit. Mus. Cat. Hym. p. 42, ♀ (1859).
Australia.

RIXOSUS, Sm. New Sp. Hym. Brit. Mus. p. 168 (1879).
Champion Bay, W.A.

ROTUNDICEPS, Sm. Brit. Mus. Cat. Hym. p. 46, ♀ (1859).
Australia.

RUBELLUS, Sm. l.c. p. 25, ♂.
Australia.

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- 665 RUBRIPES (*Thynnoides*), Guér. Voy. Coq. Zool. II. p. 233, ♂ ;
Atlas Ins. pl. viii. fig. 9 ; Klug, Berl. Abhandl. p. 22,
16 (1842).

Sydney, N.S.W.

- RUFICORNIS (*Agriomyia*), Sm. Brit. Mus. Cat. Hym. p. 34, ♂
(1859).

Swan River, W.A.

- RUFIVENTRIS, Guér. Voy. Coq. Zool. II. p. 227, ♂ ; Klug,
Berl. Abhandl. 1842, p. 19, ♀ ; Sm. l.c. p. 13, ♀.

Sydney, N.S.W.

- RUGOPICTUS, Sm. New Sp. Hym. Brit. Mus, p. 159, ♂ (1879).
Adelaide, S.A.

- SEDUCTOR, Sm. Trans. Ent. Soc. 1868, p. 234, ♂.

Champion Bay, W.A.

- 670 SEDULUS (*Agriomyia*), Sm. Brit. Mus. Cat. Hym. p. 35, ♂
(1859).

Australia.

- SENEX, Sm. l.c. p. 19, ♂.

W. Australia.

- SENILIS (*Agriomyia*), Erichs. Wieg. Arch p. 263, No. 236,
♂ (1842) ; Westw. Arc. Ent. II. p. 146.

Tasmania.

- SERRIPES, Sm. Brit. Mus. Cat. Hym. p. 44, ♀ (1859)

Australia.

- SEXMACULATUS (*Agriomyia*), Sm. l.c. p. 32, ♂.

Swan River, W.A.

- 675 SHUCKARDI, Guér. Mag. Zool. 1842, pl. c. fig. 13, ♂ ; Westw.
Arc. Ent. II. p. 136, pl. LXXXIII. fig. 5, ♀.

Sydney, N.S.W.

- SIGNATUS, Sm. Brit. Mus. Cat. Hym. p. 44, ♀ (1859) ; Sauss.
Reise Novara, Hym. p. 121.

Sydney, N.S.W.

SIMPLEX, Sm. New Sp. Hym. Brit. Mus. p. 167 (1879).
Champion Bay, W.A.

SIMILLIMUS, Sm. Brit. Mus. Cat. Hym. p. 15, ♂ (1859).
Sydney, N.S.W.

STRANGULATUS, Sm. New Sp. Hym. Brit. Mus. p. 166, ♂
(1879).
S. Australia.

680 **SULCATUS**, Sm. Brit. Mus. Cat. Hym. p. 42, ♀ (1859).
Australia.

SULCIFRONS, Sm. l.c. p. 43, ♀.
Australia.

SUSPICIOSUS, Sm. New Sp. Hym. Brit. Mus. p. 161, ♂ (1879).
Swan River, W.A.

TASMANIENSIS (*Agriomyia*), Sauss. Reise Novara, Hym.
p. 119, ♂.
Tasmania.

TENUATUS (*Agriomyia*), Sm. Brit. Mus. Cat. Hym. p. 31, ♂
(1859).
Swan River, W.A.

685 **TRIFIDUS** (*Agriomyia*), Westw. Arc. Ent. II. p. 119, pl. LXXVII.
fig. 4, ♂.
King George's Sound, W.A.

TRISTIS (*Agriomyia*), Sm. l.c. p. 34, ♂.
Australia.

TRISULCATUS, Sm. l.c. p. 45, ♀.
Australia.

TRIVIALIS (*Agriomyia*), Sm. l.c. p. 38, ♂.
Lower Plenty, Vic.

TROCHANTERINUS, Westw. l.c. p. 116, pl. LXXVII. fig. 3, ♂.
King George's Sound, W.A.

690 **TRUNCATUS** (*Agriomyia*), Sm. Brit. Mus. Cat. Hym. p. 38, ♂
(1859).
Lower Plenty, Vic.

756 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA,

TRYPHONOIDES (*Agriomyia*), Sm. l.c. p. 34, ♂; Appen. p. 68, ♀.
Adelaide, S.A.

TUBEROU LIVENTRIS, Westw. Arc. Ent. II. p. 118, pl. LXXVI.
fig. 2, ♂.

King George's Sound, W.A.

TUBERCULATUS (*Eirone*), Sm. Brit. Mus. Cat. Hym. p. 41,
♂, ♀ (1859).

Lower Plenty, Vic.

TUBEROU LIFRONS, Sm. New Sp. Hym. Brit. Mus. p. 161, ♂
(1879).

Swan River, W.A.

695 UMBRIPENNIS (*Agriomyia*), Sm. Brit. Mus. Cat. Hym. p. 31, ♂
(1859).

Australia.

UNIFASCIATUS, Sm. Breckley's Cruise of Curaçoa, p. 159,
pl. XLIII. fig. 3

Queensland.

VARIABILIS, Kirby, Trans Linn Soc. XII. p. 476, ♂, ♀, Klug.
Berl. Abhandl. p. 16, No. 4, fig. 1, ♂, fig. 2, ♀ (1812);
Guér. Voy. Coq. Zool. II. p. 223, Mag. Zool. 1842, pl. ci
figs 1-20, *Thynnus apterus*, Guér. Voy. Coq. Zool. II.
p. 230, ♀; *Thynnus flavoguttatus*, Guér. l.c. p. 230, ♀,
Thynnus Olivieri, Erichs. Wieg. Arch. p. 262, No. 235,
♂, ♀ (1812); Westw. Arc. Ent. II. p. 146; *Myzine*
aptera, Oliv. Enc. Méth. VIII. p. 137, fig. 1, ♂;
Myrmecodes flavo-guttatus, Latr. Nouv. Dict. Hist. Nat.
(2nd ed.) XXII. p. 143, ♀.

Australia and Tasmania.

VARIEGATUS (*Agriomyia*), Klug, Berl. Abhandl. p. 20, No. 12
(1812).

Australia.

VARIPEX, Sm. Brit. Mus. Cat. Hym. Appen. p. 67, ♂ (1859)

Adelaide, S.A.

- 700 **VASTATOR**, Sm. New Sp. Hym. Brit. Mus. p. 158, ♂ (1879).
Adelaide, S.A.
- VENTRALIS**, Sm. Trans. Ent. Soc. (3) II. p. 389 (1864).
Swan River, W.A.
- VESTITUS**, Sm. Brit. Mus. Cat. Hym. p. 15, ♂ (1859).
Swan River, W.A.
- VIDUUS**, Sauss. Reise Novara, Hym. p. 123, fig. LXX.
Sydney, N.S.W.
- VIGILANS** (*Agriomyia*), Sm. Brit. Mus. Cat. Hym. p. 28, ♂
(1859).
Australia.
- 705 **VILLOSUS** (*Lophocheilus*), Guér. Mag. Zool. 1842, p. 12, pl. ciii.
figs. 7-13.
Australia.
- VITRIPENNIS** (*Eirone*), Sm. Brit. Mus. Cat. Hym. p. 41, ♂, ♀
(1859).
Lower Plenty, Vic.
- VIVIDUS**, Sm. New Sp. Hym. Brit. Mus. p. 161, ♂ (1879).
Swan River and Champion Bay, W.A.
- VOLATILIS** (*Agriomyia*), Sm. Brit. Mus. Cat. Hym. p. 33, ♂
(1859).
Australia.
- WALLISII**, Sm. l.c. p. 14, ♂.
Sydney, N.S.W.
- 710 **WESTWOODII** (*Agriomyia*), Guér. Mag. Zool. 1842, p. 4 ; St.
Farg. Nat. Hist. Ins. Hym. III. p. 568 (1845).
Tasmania.
- ZELEBORI** (*Agriomyia*), Sauss. Reise Novara, Hym. p. 117, ♂.
Sydney, N.S.W.
- ZONATUS**, Guér. Voy. Coq. Zool. II. p. 222 ; Klug, Berl.
Abhandl. p. 18, 7 (1842).
Australia.

119. *ÆLURUS*.

Ælurus, Klug, Berl. Abhandl. (1840-42).

ABDOMINALIS (*Agriomyia*), Guér. Mag. Zool. 1842, p. 5;
Westw. Arc. Ent. II. p. 122, pl. LXXVII. fig. 5, ♂;
Thynnus fervidus, Erichs. Wieg. Arch. p. 263, No. 237,
♂ (1842); Westw. Arc. Ent. II. p. 146.

Tasmania.

AGILIS, Sm. Trans. Ent. Soc. (3) II. p. 390 (1864).

Swan River, W.A.

715 **ANTHRACINUS**, Sm. New Sp. Hym. Brit. Mus. p. 174, ♂ (1879).
Queensland.

AURIFRONS, Sm. Brit. Mus. Cat. Hym. p. 54, ♂ (1859).

W. Australia.

BARBATUS, Sm. l.c. p. 57, ♂

Lower Plenty, Vic.

BASALIS, Sm. l.c. p. 55, pl. III. fig. 6, ♂.

Australia

COMBUSTUS, Sm. l.c. p. 55, ♂.

Moreton Bay, Q.

720 **DENTATUS**, Sm. l.c. p. 57, ♂, ♀

Lower Plenty, Vic.

FERVENS, Sm. l.c. p. 58, ♂

Lower Plenty, Vic.

FULVIFRONS, Sm. l.c. p. 56, ♂.

Lower Plenty, Vic.

INCANUS, Sm. l.c. p. 52, ♂; Appen. p. 69, ♀.

Pt. Stephens, N.S.W.; Adelaide, S.A.

MÆRENS, Westw. Arc. Ent. II. p. 124, ♂.

Melbourne, Vic.

725 **PILOSULUS**, Sm. Brit. Mus. Cat. Hym. p. 56, ♂ (1859).

Lower Plenty, Vic.

RUBELLUS, Sm. l.c. p. 56, ♂.

Lower Plenty, Vic.

SENEX, Sm. l.c. p. 54, ♂.

Australia.

VOLATILIS, Sm. Trans. Ent. Soc. 1868, p. 237, ♂.

Adelaide, S.A.

VULPINUS, Sm. Brit. Mus. Cat. Hym. p. 54, ♂ (1859).

Hunter River, N.S.W.

120. ARIPHRON.

Ariphron, Erichs. Wieg. Arch. 1842.

730 BICOLOR, Erichs. Wieg. Arch. 1842, p. 266, No. 239, t. 5, figs. 8, 8a, ♀; Westw. Arc. Ent. II. p. 146; Sm. Brit. Mus. Cat. Hym. p. 58, pl. III. fig. 13, ♀ (1859).

Tasmania.

121. ANTHOBOSCA.

Anthobosca, Guér. Voy. Coq. (1830).

ÆTHIOPS, Sm. New Sp. Hym. Brit. Mus. p. 174, ♂ (1879).

Champion Bay, W.A.

AUSTRALASIÆ, Guér. Voy. Coq. Zool. II. p. 237, Atlas Ins. pl. VIII. fig. 10; Mag. Zool. 1842, p. 13, pl. civ.; *Thynnus australasiæ*, Klug. Berl. Abhandl. p. 24, No. 20, ♂ (1842).

Sydney, N.S.W.

CRABRONIFORMIS, Sm. Brit. Mus. Cat. Hym. p. 59, ♂ (1859).

Australia.

NIGRA, Sm. l.c. p. 59, ♂.

Melbourne, Vic.

735 VARIPES, Sm. l.c. p. 59, ♂.

Lower Plenty, Vic.

122. ZELEBORIA.

Zeleboria, Sauss. Reise Novara, Hym. p. 131 (1865).

CARINATA (*Thynnus*), Sm. Brit. Mus. Cat. Hym. p. 29, ♂ (1859); Sauss. Reise Novara, Hym. p. 131, ♂, ♀.

N.W. Australia.

FUSIFORMIS, Sauss. l.c. p. 132, ♂.

Australia.

760 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA,

IMITATRIX, Sauss. l.c. p. 132, ♂.
Australia.

XANTHORRHŒI (MS. Macleay), Sm. Brit. Mus. Cat. Hym.
p. 28, ♂ (1859); Sauss. Stettin. Ent. Zeit. p. 61 (1869).
Sydney, N.S.W.; Moreton Bay, Q.

123. TACHYNOMYIA.

Tachynomyia, Guér. Mag. Zool. 1842.

740 CÆLEBS, Sauss. Reise Novara, Hym. p. 125, ♂.
Australia.

NITENS, Sauss. l.c. p. 125, pl. iv. fig. 65, ♂.
Australia.

124. RHAGIGASTER.

Rhagigaster, Guér. Voy. Coq. (1830).

ACULEATUS, Sauss. Reise Novara, Hym. p. 113, ♂.
Sydney, N.S.W.

ÆTHIOPS, Sm. New Sp. Hym. Brit. Mus. p. 175, ♂ (1879).
Adelaide, S.A.

ANALIS, Westw. Arc. Ent. II. p. 106, 8, ♀.
King George's Sound, W.A.

745 APTERUS (*Bethylus*), Fabr. Syst. Piez. p. 238, 7, ♀; Westw.
Arc. Ent. II. p. 106, 9.
N. S. Wales.

APICALIS, Sm. Brit. Mus. Cat. Hym. p. 63, ♂ (1859).
Australia.

BIDENS, Sauss. Reise Novara, Hym. p. 112, ♂.
Sydney, N.S.W.

BINOTATUS, Westw. Arc. Ent. II. p. 105, 7, ♀; Sauss. l.c.
p. 111. ♂.
Tasmania; Sydney, N.S.W.

CASTANEUS, Sm. Brit. Mus. Cat. Hym. p. 63, ♀ (1859).
Australia.

750 COMPARATUS, Sm. l.c. Appen. p. 69, ♂.
Adelaide, S.A.

DIMIDIATUS, Sm. l.c. p. 62, ♂.

Sydney, N.S.W.

FLAVIFRONS, Sm Trans. Ent. Soc. (3) II. p. 390 (1864).

Swan River, W.A.

FUSCIPENNIS, Sm. New Sp. Hym. Brit. Mus. p. 175, ♂ (1879).
Queensland.

HÆMORRHOIDALIS, Guér. Mag. Zool. 1842, p. 2, ♂.

Swan River, W.A.

755 INTEGER (*Thynnus*), Fabr. Syst. Ent. p. 360, 3, ♂ ; Ent. Syst.
II. p. 245, 4 ; Syst. Piez. p. 231, 4 ; Donovan. Epit. Ins.
New Holl. Pl. Hym. Dipt. fig. 4 ; Kirby, Mon. Ap.
Angl. I. p. 223 ; Guér. Voy. Coq. Zool. II. p. 229 ;
Rhagigaster integer, Westw. Arc. Ent. II. p. 105, 6.
Australia.

LÆVIGATUS, Sm. New Sp. Hym. Brit. Mus. p. 176, ♂ (1879).
Champion Bay, W.A.

MANDIBULARIS, Westw. Arc. Ent. II. p. 105, 3, ♂.
Melbourne, Vic.

MORIO, Westw. l.c. p. 105, 4, ♂ ; Sauss. Reise Novara, Hym.
p. 114, ♂.
Sydney, N.S.W.

NITIDUS, Sm. Brit. Mus. Cat. Hym. p. 63, ♀ (1859).
Australia.

760 NOVARÆ, Sauss. Reise Novara, Hym. p. 112, ♂.
New Zealand and Australia?

OBTUSUS, Sm. Brit. Mus. Cat. Hym. p. 62, ♂ (1859).
Adelaide, S.A.

PUGIONATUS, Sauss. Reise Novara, Hym. p. 113, ♂.
Sydney, N.S.W.

REFLEXUS, Sm. Brit. Mus. Cat. Hym. p. 62, ♂ (1859).
Swan River, W.A.

RUGOSUS, Sm. New Sp. Hym. Brit. Mus. p. 176, ♂, ♀ (1879).
Adelaide, S.A.

762 CATALOGUE OF THE DESCRIBED HYMENOPTERA OF AUSTRALIA.

765 SIMILLIMUS, Sm. Trans. Ent. Soc. (3), II. p. 390 (1864).
Swan River, W.A.

TRISTIS, Sm. Brit. Mus. Cat. Hym. p. 63, ♂ (1859).
W. Australia.

UNICOLOR, Guér. Voy. Coq. Zool. II. p. 214, ♂; *Diamma ephippiger*, Guér. Voy. de l'Astrol. p. 235, ♀; Mag. Zool. 1842, pl. ciii. figs. 1-6; *Thynnus unicolor*, Klug, Berl. Abhandl. p. 23, 18 (1842); *Rhayigaster ephippiger*, Westw. Arc. Ent. II. p. 105.
Sydney, N.S.W.; Tasmania.

125. TACHYPTERUS.

Tachypterus, Guér. Voy. Coq. Zool. (1830).

CRASSICORNIS, Sm. Brit. Mus. Cat. Hym. p. 64, pl. iii. fig. 10, ♂ (1859).
Australia.

FASCIATUS, Guér. Voy. Coq. Zool. II. p. 217; Westw. Arc. Ent. II. p. 102.
Kangaroo Island, S.A.

126. ONCORHINUS.

Oncorhinus, Shuckard, Grey's Journ. 1841.

770 XANTHOSPILOS, Shuck. Grey's Journ. of two Exped. Append. II. p. 471, ♂ (1841); Sm. Brit. Mus. Cat. Hym. p. 65, pl. iii. fig. 15, ♂ (1859).
King George's Sound, W.A.

127. DIAMMA.

Diamma, Westw. Proc. Zool. Soc. (1835).

BICOLOR, Westw. Proc. Zool. Soc. 1835, pt. 3, p. 53, ♀; Arc. Ent. II. p. 21, pl. LIV. fig. 6, ♀; Guér. Voy. Coq. Zool. II. p. 235; *Psammatha chalybea*, Shuck. Trans. Ent. Soc. II. p. 69, pl. VIII. fig. 1, ♂; Westw. Arc. Ent. p. 20, pl. LIV. fig. 5, ♂; *Tachypterus chalybeus*, Westw. Arc. Ent. II. p. 102, ♂.

Sydney and Melbourne, Australia; Tasmania.

ON THE GENUS *DODONÆA*.

BY REV. W. WOOLLS, PH.D., F.L.S.

According to Baron F. von Mueller's Census, 43 species of *Dodonæa* have been described as Australian, and these are distributed in various proportions throughout the Australian colonies, two only (*D. ericifolia* and *D. viscosa*) extending to Tasmania, whilst N. S. Wales has nineteen. Mr. Bentham seems to have felt some difficulty in arranging the species as they are deficient in many instances of any positive characters, even "the form of the wings" on the capsule (on which much reliance had been placed) being as variable as the leaves. Baron Mueller, in his *Victorian Plants*, p. 86, expresses himself very doubtfully respecting some of the so-called species, which he would regard as varieties of *D. viscosa* (Linn.). Amongst these is a plant, of which I collected specimens more than twenty years ago on the banks of the Parramatta River, and of which he remarked that "it exhibited on the same branchlets simple and pinnate leaves, and their intermediate forms." It is worthy of record that though several intelligent collectors have searched for this shrub, or one similar to it, they have not been successful; and therefore I am inclined to think that the opinion expressed by Baron Mueller is correct. A plant of a similar character was found on the Hastings River by the late Dr. Beckler, and that the Baron designated var. *megazyga* of *D. viscosa*; but Mr. Bentham, as may be seen by referring to Vol. I. of the *Flora Australiensis*, p. 483, has raised these forms to the dignity of a species. Whether a true species or not, it is certain that some of the *Dodonæas* have simple and pinnate leaves on the same branches, as may be seen in the specimen of *D. attenuata* (A. Cunn.), from the Murrumbidgee. Mr. Bentham remarks that some forms of this species almost pass into *D. lobulata* (F.v.M.); but in the specimen now under consideration, the leaves are rather pinnate than pinnatifid, and they

are differently arranged, whilst the former shrub is smaller and more diffuse in habit. Mr. J. E. Brown's figures of the Forest Flora of S. Australia, are very useful in illustrating *D. lobulata* (F.v.M.), *D. microzyga* (F.v.M.), and *D. viscosa* (Linn.), which he calls the lobe-leaved "Hop," the small-leaved "Hop," and the Native "Hop," the second only being limited to S. Australia. The species of *Dodonæa* have acquired the name of "Hops," from the resemblance which their fruits bear to those of the true hop, *Humulus lupulus*; and it is a curious fact, that, although in the systematic classification of plants *Humulus* of the *Cannabinaeæ* and *Dodonæa* of the *Sapindaceæ* are not allied to each other, yet the fruit of the latter is used in the interior in raising yeast for bread making. Some years since I ascertained this on the Castle-reagh, and I am told that it is still used on some of the remote stations for the same purpose. The smaller species of *Dodonæa* are much relished by sheep, and in dry seasons are a valuable addition to the native forage, the larger shrubs being cut down for that purpose.

ANTICOMA :

A GENUS OF FREE-LIVING MARINE NEMATODES.

BY N. A. COBB.

The first carefully described *Anticoma* was taken by Eberth from the Mediterranean Sea, and it figured in that author's "Untersuchungen über Nematoden" as *Odontobius acuminatus*. Seemingly by a misprint, the neck was stated to be one-third as long as the body. This led Bastian, who was the next naturalist to discover one of these worms, and the first to realise their proper systematic position, to describe as a species distinct from Eberth's, *Anticoma limalis*. Nevertheless Bastian's *limalis* was doubtless identical with Eberth's *Odontobius acuminatus*, as Bütschli has already suggested. Bastian saw the necessity of creating a new genus for his species, and therefore originated the name *Anticoma*. Living with his *Anticoma limalis* Bastian found another worm, to which he gave the name *Anticoma pellucida*. This latter did not differ in proportions from *limalis*, nor much in size. Bastian failed however to discover in it the ventral gland, and this, together with the fact that he failed also to see the pectoral hairs in *limalis*, was doubtless his reason for describing it as a separate species. I think there can be no doubt that it was specifically identical with *limalis*. Bütschli, who afterwards found *limalis* at Kiel, pointed out the position and number of the pectoral hairs, and his figure shows these hairs exactly as given in Bastian's figure for *pellucida*.

The next naturalist to find an *Anticoma* was Villot, but neither Villot's descriptions nor his figures are adequate for the determination of the species which he observed. He saw Bastian's *limalis*, and mentions under the head of *Anticoma* two other species, one of which is certainly not a member of that genus, and the other possibly not.

Later, De Man found an *Anticoma* at Naples which he described and figured under the specific name *tyrrhenica*, remarking that the difference between it and Eberth's *O. acuminatus* might not be very important. There is reason to believe that the worm which De Man had before him was in reality the same that Eberth had described. Eberth's *acuminatus*, i.e. Bastian's *limalis* and *pellucida*, is one of the commonest species along the coast at Naples. During a somewhat careful examination of thousands of free-living Nematodes collected at Naples during the autumn and winter of 1888-9 the writer has as yet observed but a single species of *Anticoma*, namely, Bastian's *limalis*. De Man's specimen measured 1.3 mm. *Anticoma limalis* sometimes, but not often, comes to maturity at that size. These facts, together with the general accord among the figures of Eberth, Bastian, Bütschli and De Man, and the latter's own remarks on *tyrrhenica*, lead me to believe that, up to 1878, the species first discovered by Eberth had been described under four different specific names,—*acuminatus*, *limalis*, *pellucida* and *tyrrhenica*, and I suggest that henceforth all these names be regarded as synonymous. The species becomes then *Anticoma acuminata*, Eberth (Syn. *A. limalis*, Bast., *A. pellucida*, Bast., *A. tyrrhenica*, D.M.)

Only two other species of *Anticoma* have been described, namely, *A. Eberthi*, Bast., and *A. leptura*, Marion. I here add to the genus its fourth species under the name *A. typica*.

ANTICOMA, Bastian.

A genus of marine Nematodes having the average formulae $\frac{2}{7} \frac{1}{1} \frac{3}{27} \frac{298}{32} \frac{46^{100}}{16} \frac{89.5}{16} 3$ mm and $\frac{2}{8} \frac{108}{2} \frac{26}{26} \frac{M^{30}}{31} \frac{9}{13} \frac{2}{13} 2.6$ mm. Hairs so small as generally to escape notice occur on the cuticula throughout the length of the worm. On the lateral lines, however, and sometimes on others of the six main lines, occur, near the head, longitudinal rows of closely approximated and innervated *pectoral hairs*, which will be rarely overlooked by the careful observer. From the position of these peculiar hairs the genus takes its name. There are ten cephalic setae; one dorsal, one ventral, and a pair on each

of the four submedian lines. The cuticula is not striated. Lateral organs in the form of slits occur close behind the cephalic setæ. When the head is viewed dorso-ventrally, these openings, which are ordinarily invisible or at most barely glimpsed as transverse lines one-fourth as long as the head is wide, come clearly into view as two narrow passages leading inward and backward. A unicellular ventral gland is present in all the species. Near the nerve-ring, which encircles the œsophagus squarely and is about as wide as the œsophagus at the point encircled, lie six longitudinal masses of nerve-cells, of which the four larger are submedian and the two smaller median. All the known species are eyeless. The pharynx is a mere shallow conoid depression surrounded by three rudimentary lips, which rarely bear papillæ. The œsophagus is conoid and terminates in an obscure cardia, which barely penetrates the thin-walled intestine. The cardiac collum is shallow but distinct. The rectum is equal in length to the anal diameter. The tail is conoid in its anterior part, while the remainder—more than half—is slender and narrowly conoid to the slightly swollen ellipsoidal terminus, which bears a conical outlet for the caudal glands. The lateral fields are usually inconspicuous. The reflexed portions of the two symmetrically-placed ovaries, contrary to the general rule, are nearly cylindrical. Both before and behind the vulva occur unicellular glands. The eggs do not begin segmentation until after being deposited. The male possesses no bursa and none but inconspicuous papillæ. Certain anal hairs, so small that they are readily overlooked, probably serve as male papillæ. A sigmoid, tubular and chitinous accessory organ occurs in the ventral region just in front of the two equal spicula. The anterior straight testicle, directed forward, is invariably somewhat larger than the posterior one, which is also directed forward and presents the peculiarity in most of the species of being reflexed near its free extremity. Of the two testicles, the anterior is connected with the vas deferens by the longer duct. The ductus ejaculatorius is narrow and composed of two rows of cells. The numerous spermatozoa are more or less elongated and each possesses an elongated nucleus. The species live among algæ, and are probably

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herbivorous. Now and then diatoms are seen in the alimentary canal.

KEY.

- Porus near the nerve-ring..... 1. *typica*.
 Porus about half way between the nerve-ring and
 head 2. *Eberthi*.
 Porus near the head.
 Pectoral hairs lateral only, few (five)..... 3. *acuminata*.
 Pectoral hairs median (?) and submedian,
 numerous..... 4. *leptura*.

1. *A. typica*, n.sp. $\frac{1}{5}$ $\frac{10.5}{2}$ $\frac{30.2}{3.5}$ $\frac{45.25}{5.5}$ $\frac{65.4}{1.3}$ 1.27 mm. This is a homo-



FIG. 1. *Anticoma typica*

cephalous species which may almost be said to be devoid of a pharynx. The neck is slightly convex-conoid, especially in front of the pectoral hairs, which occur in two opposite lateral sets of four each at one-fourth the distance from the mouth to the nerve-ring. The cephalic setae stand out half way between the anterior extremity and the lateral organs, the latter being a little in front of half way between the anterior extremity and the pectoral hairs. All these particulars are shown in the upper right figure in the adjacent illustration. The oesophagus is about one-third as wide as the neck, except in the posterior third where it gradually becomes one-half as wide as the neck. The tessellated intestine becomes at once two-thirds to three-fourths as wide as the body and is found to be composed of cells of which about fifteen side by side make up the circumference. The ellipsoidal or oblong unicellular ventral gland (as long as the body is wide) is situated just in front of the cardiac collum, and presents the peculiarity of being reflexed and extending forward from the point of juncture with its duct. This latter meanders with somewhat irregular width to the

rather conspicuous ampulla, situated just in front of the nerve-ring. Here the excretions find exit through the porus, which is connected with the ampulla by a very short chitinous tube. The ventral gland and its duct are shown black in the illustration. The lateral fields are very inconspicuous, at least in specimens prepared in balsam. Concerning the number of caudal glands I am uncertain. Near the anus, sometimes in front of it (males) and sometimes behind it (females), occurs a unicellular caudal gland of large dimensions, characterised by staining strongly in carmine. I believe there are other caudal glands (probably two), but am unable to give details either as to position or structure. The ovaries extend one-half to two-thirds the way back to the inconspicuous vulva, and are nearly as wide at their blind extremities as elsewhere. The eggs are a trifle longer than the body is wide, and one-half as wide as long. It is rare, according to my observations, to find more than one egg in the uteri, the two ovaries apparently maturing the eggs alternately. (See the left-hand figure in illustration 1.)

$\frac{0 \quad 11.4 \quad 21. \quad .24^{23} \quad 87.4}{0 \quad 2.1 \quad 2.4 \quad 2.8 \quad 2.3} 1.3 \text{ mm.}$ The tail of the male closely resembles that of the female. The uniformly arcuate spicula are twice as long as the anal diameter, and when in action are guided by two enveloping accessory pieces nearly half as long. A casual glance at the spicula would leave the impression that they were of nearly uniform size throughout, but careful study shows the proximal halves to be enlarged. The single small ventral accessory organ is placed in front of the anus at a distance one and one-third times greater than the length of the spicula. (Consult the lower right-hand figure in illustration 1.)

The details of the male generative apparatus are set forth in the illustrations on the following page. Both testicles extend forward, only the blind extremity of the smaller posterior testicle being reflexed. Each empties by means of a narrow duct (necessarily much longer for the anterior one than for the posterior) into the vas deferens. This latter is connected with the exterior by means of a long and slender ductus ejaculatorius, composed of two rows

of cells. In the illustration the development of the spermatozoa is shown by means of the three small figures placed to the left of



FIG. 2. *Anticoma typica*.
♂ Sexual apparatus.

the anterior testicle, each phase of the development being placed opposite the portion of the testicle in which it occurs. The first definite arrangement noticeable in the protoplasm of the blind end of the testicle is a grouping together into spherical masses of certain minute bodies whose number and position are discoverable only through their nuclei. In this stage there seems to be no cell wall. In the second stage each of these agglomerations appears surrounded by a cell wall. Each nucleus now becomes elongated, and all arrange themselves in a radial direction, after which the single multinucleated cell splits up into somewhat pyriform spermatozoa, each possessed of one elongated nucleus. One of these latter is represented in the largest of the three small figures. Illustrations of the histological details of the vas deferens and ductus ejaculatorius are placed opposite those organs in Fig. 2.

Habitat.—Both sexes of this species were found to be common among algae on the coasts of the Island of Ceylon in the winter.

2. *A. Eberthi*, Bast. $\frac{1}{4}$ 5.7 12.6 40 95.6 8.35 mm. The slightly convex-conoid neck is surmounted by an expanded lip-region. There are at least six cephalic setae. Five pectoral hairs occur on either lateral line just behind the pharyngeal region. The junction of the conoid oesophagus with the tessellated intestine is marked by a shallow but distinct cardiac collum. The rectum is only one-half as long as the anal diameter. The excretory pore is situated 3.6% of the length of the animal from the anterior extremity. The tail is concave-conoid to the slightly swollen ellipsoidal terminus, which is about one-fourth as great in diameter as the base of the tail. Bastian observed two anal glands.

$\frac{.1}{.5} \frac{6.7}{1.3} \frac{12.5}{1.8} \frac{M}{2.5} \frac{96.2}{1} 5.1 \text{ mm.}$ The tail is somewhat irregularly conoid to near the middle; thence to the slightly swollen terminus it is uniformly as wide as the spicula. These latter are nearly half as long as the tail, and are arcuate, particularly in the distal part. They diminish uniformly in size from the scarcely contrasted proximæ to the acute distal extremities, and are said to be destitute of accessory pieces. The supplementary ventral organ is one-fourth as long as the spicula and is situated in front of the anus at a distance from it equal to the length of the tail.

Habitat.—Roots of coralline, coast of England.

3. *A. acuminata*, Eberth. The following formulæ and descriptions are made up from the notes of Bastian, Bütschli and De Man, with the aid of my Naples material. Bastian observed neither the pectoral hairs of his *limalis*, nor the porus of his *pellucida*, and thus made out two species from specimens belonging in reality to but one,—the one already described by Eberth under the name *Odontobius acuminatus*. De Man's *tyrrhenica* is no doubt a small *acuminata*.

$\frac{2}{6} \frac{9}{2} \frac{20.6}{2.8} \frac{.46^{24}}{3.3} \frac{89}{1.7} 2.3 \text{ mm.}$ This is a slightly heterocephalous species, with a small pharynx ending nearly opposite the cephalic setæ. The neck is nearly conoid. The head is rounded in front, and is set off by an almost imperceptible constriction just behind the cephalic setæ. Three lips, without papillæ, are barely distinguishable. A longitudinal row of five closely approximated pectoral hairs is found on either lateral line at a distance from the mouth one-sixth as great as that of the nerve-ring from the mouth. The lateral organs are situated half way between the cephalic setæ and the porus. The conoid œsophagus is one-half to two-thirds as wide as the neck, and a distinct cardiac collum marks its junction with the intestine. The thin wall of the tessellated intestine is composed of a single layer of cells of such a size that seventeen side by side make up the circumference. The unicellular ventral gland is situated just in front of the cardiac collum and is not reflexed as in *Anticoma typica*. It empties by means of a rather wide duct

and a somewhat wider ampulla through a ventral porus situated half way between the mouth and the pectoral hairs (i.e. at $8\frac{1}{2}\%$). The lateral fields are one-third as wide as the body; the median fields are much narrower. The tail is convex-conoid to near the middle, where it is one-fourth to one-fifth as wide as at the anus; thence it narrows gradually to the ellipsoidal and slightly swollen terminus, which gives exit to the secretions of the caudal glands,—in other words the tail is almost exactly like that of *Anticoma typica*. The slightly projecting vulva is accompanied by four unicellular glands, of which two lie in front of it and two behind it. One to three rather thick-shelled eggs, two-thirds as wide as the body and about twice as long as wide, are usually to be found in the uteri. The ovaries reach one-half to two-thirds the way back to the vulva. Next the uteri, the developing ova, of which there are often twenty in each ovary, lie in single file, but farther back (especially near the blind extremities) they are arranged in several parallel rows.

$\frac{2}{4} \frac{10.2}{21} \frac{21.1}{21} \frac{M^{10}}{3.2} \frac{88.3}{21} 19 \text{ mm.}$ The tail of the male is much like that of the female. The remarks concerning the anal glands of *Anticoma typica* apply also to this. The testicles also are arranged much as in *A. typica*, and all the remarks made on the histology of these organs in the description of that species may be understood to be repeated here. The spicula are arcuate throughout, though less distinctly so near the middle, and are twice as long as the anal diameter. Unless carefully examined they appear to be of nearly uniform size throughout. In reality they are much larger in the proximal part. The proximæ are not cephalated. The enveloping accessory pieces are inconspicuous. Oblique copulatory muscles occur in the region occupied by the organs of copulation. The ventral supplementary organ is situated a little in front of the spicula and is about one fourth as long as these latter. Opposite the spicula occur four pairs of equidistant submedian hairs, and considerably behind the anus occur two pairs of hairs also submedian.

SPECIMENS. *A. leucæ*, Bast.; *A. pellucida*, Bast.; *A. tyrrhenica*,

Habitat.—This species is very common among algæ on the coasts of the European branches of the Atlantic Ocean.

4. *A. leptura*, Marion. $\frac{.5}{1.4} \frac{14.8}{2.7} \frac{25.6}{3.5} \frac{30^{.30}}{4.} \frac{86.8}{1.8}$ 2 mm. The pectoral hairs are grouped in six rows, four of the rows being submedian and two median. These rows, each about as long as the head is wide, and each consisting of about a dozen closely approximated hairs, are situated on the anterior part of the conoid neck somewhat behind the porus, the median rows growing a little farther back than the submedian. Six (?) long and slender setæ occur on the head. Each of the three (?) lips is surmounted by a large conical papilla. The conoid œsophagus is one-third to two-fifths as wide as the neck and passes the food on to an intestine three-fourths as wide as the body. The excretory pore occurs at 2.5 per cent. The tail is conoid to the slightly swollen ellipsoidal terminus, which gives exit to the secretions of the caudal glands. The lips of the vulva project slightly. The ovaries extend two-thirds the distance back to the vulva, and near their blind extremities are packed with developing ova arranged in several parallel rows. The uteri commonly contain two or three unsegmented eggs as long as the body is wide and less than twice as long as wide.

$\frac{.5}{1.4} \frac{14.8}{2.7} \frac{25.6}{3.5} \frac{M}{4.} \frac{88.8(?)}{1.8}$ 2 mm. The linear (?) spicula are arcuate in the distal third and present bifurcated proximæ. The short accessory pieces surround the spicula near the anus. The presence of a supplementary organ has not been noted.

Habitat.—Rocks, Pharo, coast of France. Common in February.

EXPLANATION OF FIGURES.

Fig. 1.—*Anticoma typica*. The ♂ is shown in full, ×65: anteriorly are seen the œsophagus (grey), the nerve-ring (white) and the ventral gland (black); through the middle, the intestine (dark) and the sexual organs (light). The upper right-hand figure shows the head in dorso-ventral view, ×450. The lower right-hand figure shows the anal region, ×350: to be seen are the

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apiculae, their accessory pieces, a caudal gland and, higher up, the small sigmoid accessory organ. The form of the end of the tail is illustrated by the smallest of the figures; $\times 350$. A portion of a ♀ is shown at the left, $\times 120$: one half the sexual organs and a portion of the tessellated intestine are shown; an egg lies near the inconspicuous vulva, and this last, with the four adjacent glands, is shown in ventral view in the only remaining figure, $\times 200$.

Fig. 2.—♂ organs of *A. typica*. To the right the entire apparatus, $\times 150$ —to be seen are the anterior straight testicle, the posterior testicle with reflexed extremity, the vas deferens (gray), and the long narrow ductus ejaculatorius ending below between the two apiculae and accessory pieces. To the left above, three phases in the development of the spermatozoa ($\times 900$); each phase is placed opposite the part of the testicle in which it occurs. The two lower left-hand figures show the histological details of the vas deferens and the ductus ejaculatorius at the points opposite which they are placed, $\times 450$.

NOTES ON AUSTRALIAN COLEOPTERA, WITH DESCRIPTIONS OF NEW SPECIES.

BY THE REV. T. BLACKBURN, B.A., CORR. MEM.

PART IX.

CARABIDÆ.

DYSCHIRIUS OVENSSENSIS, sp.nov.

Angustus ; sat elongatus ; nitidus ; niger, antennis basi pedibusque plus minus picescentibus, elytris pone medium macula magna sanguinea utrinque ornatis ; prothorace ovali, quam latiori vix longiori ; elytris basi subgibbosis, pone partem gibbosam transversim impressis, in parte antica tertia fortiter seriatim punctulatis, alibi (parte antica declivi inclusa) lævibus ; tibiis anticis extus bidentatis.

[Long. 1-1 $\frac{1}{4}$, lat. $\frac{2}{3}$ line.

This species is evidently allied to *D. Mastersi*, MacL., and *Stephensi*, MacL., from which the large sanguineous blotch on each elytron will at once distinguish it. The two teeth on the external margin of the front tibiæ are both small ; the external apical prolongation of the tibia itself is slender and very elongate, and is moderately curved outwards towards the apex.

Victoria ; on the banks of the Ovens River.

DIAPHOROMERUS.

I attribute the following species to this genus with extreme hesitation ; although I cannot find any structural character absolutely requiring separation its facies is totally unlike that of any of the hitherto described species. Its general appearance is

that of a *Nebria*, and suggests the idea of *Nebriosoma* of Castelnau, but the author of that genus attributes to it a mentum devoid of a median tooth whereas in the insect before me the median tooth of the mentum is well developed (simple, and pointed at the apex). *Loxomerus* (from the Auckland Islands) and *Migadops* (from S. America) are also *Nebria*-like *Anisodactylid* genera, but *inter alia* the former is apterous, and the latter has the intermediate tarsi of the male not (or scarcely) dilated, whereas the present insect is winged and has the intermediate tarsi of the male dilated scarcely less strongly than the anterior. Is it possible that Count de Castelnau was mistaken as to the mentum of his *Nebriosoma*? Were it not for this doubt I should be disposed to form a new genus for the species before me, but with that doubt in my mind I prefer not to do so.

I am afraid it can only be by the exhaustive process that this insect can be placed even provisionally in *Diaphoromerus*, but I select that genus on the one hand because the Baron de Chaudoir in his monograph of it (Ann. Mus. Gen. 1878) has already made it a receptacle for extremely diverse forms, and on the other hand because the main structural characters of de Chaudoir's first group of *Diaphoromerus* accord fairly well with the structural characters of the present insect in spite of extreme superficial difference. These characters are as follows,—mentum toothed, 2nd joint of labial palpi plurisetose; ligula free at the apex; the 4 anterior tarsi of the male very strongly dilated and having the 1st joint much narrower than the following joints, the 4th subbilobed, and the basal 4 all spongiose beneath (it is to be noted however that the 4th joint is somewhat smaller than in the *Diaphoromeri* of de Chaudoir's first group); hind tarsi slender and elongate, with the basal joint much longer than the second.* The principal characters that I notice as disqualifying the present insect for association with the first group of *Diaphoromerus* are as

* This very important character seems to have been overlooked in some instances by de Chaudoir; otherwise he could surely not have associated in one genus *Harpalus Germari*, Cast., and *H. mornatus*, Germ.

follows,—prothorax strongly cordate and much narrower at the base than the base of the elytra ; elytra without a vestige of either an abbreviated scutellar stria or a setiferous puncture on the 3rd interstice. The combination of characters mentioned above as agreeing with *Diaphoromerus* will separate this species from *Anisodactylus*, *Gnathaphanus*, *Haplaner*, *Hypharpax*, *Lecanomerus*, *Thenarotes*, and *Notophilus*. Of the other genera of *Anisodactylides* attributed to Australia, *Geobaenus* (founded on an African insect) is probably an incorrect determination, but if correct *Geobaenus* has the intermediate tarsi of the male simple,—in any case the species (*G. Australasice*) is quite different from that I am describing ; *Mirosarus*, Bates (1878), appears to be only another name for some or all of the species which de Chaudoir in the same year referred to *Gnathaphanus*.

DIAPHOROMERUS VICTORIENSIS, sp.nov.

♂ Niger ; antennis (apicem versus parum infuscatis), palpis, pedibusque testaceis ; nonnullis exemplis capite prothoracis elytrorumque marginibus, et horum epipleuris, plus minus dilutioribus ; antennis robustis corporis dimidio vix brevioribus, prothorace cordato quam longiori vix dimidio latiori, canaliculato, postice utrinque longitudinaliter impresso, parte basali punctulata, angulis posticis acute rectis ; elytris fortiter striatis, striis marginem apicemque versus haud obsoletis, interstitiis minus convexis, interstitio 3° puncturam setiferam haud ferenti, stria abbreviata scutellari nulla.

♀ latet.

[Long. 4, lat. $1\frac{3}{8}$ lines.

Mountains of Victoria.

HYPHARPAX VILIS, sp.nov.

Sat elongatus ; sat parallelus ; piceus vel brunneus, plus minus æneo- vel viridi-micans, mandibulis (apice excepto) labroque plus minus rufis, palpis antennis (his nonnullis exemplis apicem versus fuscescentibus) elytrorum epipleuris et (nonnullis exemplis) prothoracis elytrorumque margine tenui

testaceis ; prothorace fortiter transverso, postice quam antice vix latiori, postice utrinque foveolato, foveolis leviter punctulatis, lateribus modice rotundatis, angulis posticis rotundato-obtusis, latitudine majori ante medium posita ; elytris minus subtiliter striatis, interstitiis lævibus sat planis, interstitio suturali postice angustato subcarinato, 3° juxta apicem puncto setifero impresso.

Maris tarsis anticis et intermediis minus fortiter dilatatis, femoribus posticis subtus dente magno armatis, tibiis posticis intus sinuatis apicem versus fortiter arcuatis.

[Long. 3-3½, lat. 1-1½ lines.

This species, although common and widely distributed in South Australia, seems to have escaped receiving a name hitherto. In a long series before me I find an invariable character in the brown or pitchy tone of the upper surface, the green or brassy tint always appearing as a kind of gloss or polish quite distinct from the real colour. The colour of the undersurface varies from brownish testaceous (probably in immature examples only) to dark pitchy. In some examples the antennæ are a little infuscate, but I do not find any variation in the colour of the legs. The prothorax is rather more than half again as wide as long ; it is obscurely punctured immediately within the lateral margin and more distinctly in and about the basal foveæ ; its hind angles though much rounded off are quite distinct. The elytra at their base are considerably wider than the base of the prothorax ; their abbreviated sutural stria is variable but never either non-existent or very strongly marked. The hind trochanters are about half as long as the hind femora ; they are nearly straight and are blunt at the apex.

The present insect is near *H. inornatus*, Germ., from which it differs (apart from colour) by the much more strongly rounded sides of the prothorax, and the very much less strongly dilated tarsi of the male, it is much like *H. Deyrollei*, Cast., in colour,—but the latter species has shorter antennæ, prothorax devoid of puncturation and with hind angles quite rounded off, feebler

elytral sculpture, &c. Of the Australian species of *Hypharpax* described by the Baron de Chaudoir in his monograph of the genus (Ann. Mus. Gen. 1878), the only species described as having the legs testaceous is one from Cape York which the author abstained from naming because he had not seen a male, which he thought might possibly be a var. of *H. flavitarsis*, and which is considerably larger than the present insect. Of the species attributed by the Baron to *Diaphoromerus*, I have no doubt that some belong properly to *Hypharpax*, and several of the latter might (in respect of colour) be confused with *H. vilis*. These are as follows,—*Flindersi*, Cast., which has the hind femora of the male unarmed,—*mandibularis*, Cast., of which the male is unknown, but its habitat in North Queensland and very small size are at variance with any likelihood of identity with this S. Australian species,—*flavipalpis* (also from N. Queensland) in which the prothoracic foveæ are said to be impunctate and the setiferous punctures of the elytra remote from the apex,—and *Dampieri* in which the elytral punctures are said to be invariably wanting and the prothorax narrower at the base than in front.*

N.B.—This species has been mixed in my collection until lately with *H. Deyrollei*, Cast., and I have only recently observed its undoubted distinctness; I fear it is probable that I may have named it for some of my correspondents as being *H. Deyrollei*.

Adelaide, Port Lincoln, Port Augusta, Lake Eyre Basin, &c.

LECANOMERUS NITIDUS, sp.nov.

Sat brevis; sat latus; nitidus; piceo-niger nec iridescens; antennis (basi testacea excepta) fuscis; labro mandibulisque (his apice nigris) rufis; palpis pedibusque testaceis; prothoracis elytrorumque marginibus vix rufescentibus; prothorace leviter transverso, canaliculato, lævi, postice utrinque leviter impresso, angulis posticis subrotundatis; elytris sat fortiter

* The Baron in describing *D. Dampieri* states that it is the only species of the genus presenting this character, and then on the next page but one attributes the same character to *D. Deyrollei*.

striatis, stria abbreviata suturali vix manifesta, interstitiis minus planis, interstitio 3^o pone medium puncto setifero instructo; tarsis posticis minus elongatis.

[Long. 2½, lat. 1 line (vix).

The small size of this species together with its short broad build, strongly striate elytra, impunctulate prothorax, comparatively short hind tarsi, &c., will at once distinguish it from its congeners.

Mountains of Victoria.

THENAROTES DISCOIDALIS, Blackb.

In my original notice of this species (Trans. Roy. Soc. S.A. 1887, p. 184) I mentioned an insect which appeared to me to be a small dark variety for which I proposed the name "*minor*, var.?" Recently I have found on the mountains of Victoria what I take to be another variety of the same species differing from the type in respect of size and colouring, but presenting no other tangible distinction that I can discover. It is possible that these forms represent in reality several distinct closely allied species,—and they differ I think markedly enough to be entitled to a var. name,—but I think it more probable that they are simply local races of a single type. The following description will distinguish the form before me.

Var. ? *nigricornis* Antennis (articulis basalibus 2 exceptis) nigro-piceis; elytris piceis, marginibus (basi excepta) anguste rufis. [Long. 1½ lines.

I may add that the posterior angles of the prothorax seem a trifle more markedly defined, and the basal region of the same segment seems a little more coarsely and less closely punctured than in the type.

NOTOPHILUS MONTANUS, sp. nov.

Sat nitidus; piccus; antennarum basi, capite (parte inter oculos nonnullis exemplis excepta), prothorace, sutura, pedibusque, plus minus dilutioribus; prothorace postice quam antice vix angustiori; elytris (stria suturali excepta) vix manifeste striatis. [Long. 1 1¼ lines.

This minute species is coloured very differently from its previously described congeners; usually it is of a dark pitchy brown tone with the lighter parts livid testaceous, but in some specimens the lighter parts (especially the head and suture) are nearly of the general colour. Compared with *N. parvus*, Blackb., (which is about the same size), the prothorax is a little less narrowed hindward so that its sides appear more evenly rounded, it is less strongly depressed across the basal part, and its hind angles are more rounded off.

Mountains of Victoria.

AMBLYTELUS.

The following species appear to be typical members of this genus, having the mentum, tarsi, carina at external edge of hind part of 7th elytral stria, &c., &c., as in *A. curtus*, Fab. Of previously described species *A. curtus*, Fab., and *vittatus*, Motsch., differ entirely in style of markings, while *amplipennis*, MacL., is much larger, and *minutus*, MacL., much smaller,—the latter two moreover being described as unicolorous reddish-brown insects with testaceous legs and antennæ.

AMBLYTELUS INORNATUS, sp. nov.

Ferrugineus, elytris (margine laterali,—et nonnullis exemplis sutura,—exceptis) nigro-fuscis; prothorace fortiter transverso, lævigato, canaliculato, marginibus lateralibus late reflexis fortiter rotundatis mox ante angulos posticos vix sinuatis, his rectis; elytris subtiliter striatis, striis subtiliter obsolete punctulatis, interstitiis sat planis (marginali excepto) lævigatis. [Long. $3\frac{2}{3}$ -4, lat. $1\frac{2}{3}$ - $1\frac{3}{4}$ lines.

The prothorax is two-thirds again as wide as long and is a little wider at the base than across the front margin, which is very gently emarginate. The interstices of the elytral striæ are not quite so flat near the apex as near the base.

Mountains of Victoria.

AMBLYTELUS DISCOIDALIS, sp. nov.

Ferrugineus, elytris (margine laterali, et plaga magna communi elongata basali, exceptis) nigro-fuscis; prothorace fortiter transverso, lævigato, canaliculato, marginibus lateralibus late reflexis fortiter rotundatis mox ante angulos posticos vix sinuatis, his acute rectis fere subdentiformibus; elytris subtiliter striatis, striis subtiliter (nullo modo obsolete) punctulatis, interstitiis planis (marginali excepto) lævigatis.

[Long. $3\frac{2}{5}$, lat. $1\frac{1}{2}$ lines.

This species does not seem to vary in colour and markings,—but some varieties of the preceding species in which the suture is pallid anteriorly are a good deal like it. It appears to be constantly as small as the smallest specimens of *A. inornatus*, and is a shorter, wider looking insect. Its elytra are distinctly ovate (i.e., at their widest behind the middle) while those of *inornatus* are elongate-oval and are scarcely if at all wider behind the middle than at a short distance behind the base. The hind angles of the prothorax are very distinctly sharper in the present species, the striae of the elytra are very much more distinctly punctulate, and those near the suture are scarcely marked in front (being represented by rows of fine punctures), while the interstices of the striae are flatter, being absolutely flat in front and even towards the apex scarcely less so; the cariniform external edge of the 7th stria does not extend so far forward on the elytra.

S. Australia,—Port Lincoln, Yorke's Peninsula, &c.

TACHYS BALDIENSIS, sp. nov.

Ovalis; sat brevis, nitidus; niger; antennarum basi, ore, metasterno, coxis, pedibusque rufescentibus; prothorace sat fortiter transverso, postice quam antice vix latiori, canaliculato, postice utrinque profunde impresso et mox ante basin profunde transversim sulcato, lateribus sat anguste marginatis antice leviter rotundatis postice fere rectis, angulis posticis

acute rectis ; elytris singulis strias 2 juxta suturam (1^a circum apicem continuata et in disco antrorsum producta) 1^{que} marginalem (hac postice duplicata) profunde impressas ferentibus,—striis (nisi apicem versus) crassissime punctulatis,—inter strias 2^{am} et marginalem stria 3^a subtili crasse punctulata antice posticeque abbreviata et puncturarum ex ordine obsoletioribus seriebus nonnullis instructis.

[Long. $1\frac{1}{2}$, lat. $\frac{1}{2}$ line.

This species is evidently allied to *T. semistriatus*, Blackb., and *Flindersi*, Blackb., (Trans. Roy. Soc. S.A. 1887, p. 41), which I referred to *Tachys* (with extreme hesitation on account of peculiarity of facies and sculpture) on the ground of their front tibiæ being shaped as in that genus, and their elytra having the sutural stria recurved. Compared with *T. Flindersi* the present insect has somewhat longer antennæ and larger less prominent eyes, the prothorax wider across the base than across the front and with the sides less rounded so that the segment appears less cordiform, and elytra much more coarsely punctulate-striate as regards the sutural, the 2nd, and the marginal striæ, but having the other striæ (except the recurved portion of the sutural and the middle of the 3rd) quite obsolete and represented only by rows of punctures which become successively finer as they approach the margin till they are scarcely traceable ; it is moreover a much larger species and much less parallel, the sides of the elytra especially being much more rounded. The appearance of the marginal stria of the elytra being duplicated behind seems to be caused by its becoming wider and the widened portion being intersected by a keel. There seem to be some setigerous punctures on the 3rd interstice, but owing to the extremely coarse puncturation of the adjoining stria I cannot identify them certainly except by their setæ some of which seem to have been rubbed off in the example before me as they differ on the two elytra. My specimen is a female ; it has two large setigerous punctures on either side of the apical ventral segment a little behind the apex. The apical joint of the maxillary palpi is scarcely half as long as the preceding joint.

Victorian Alps; on a mountain called Baldi, at an elevation of about 6000 feet above the sea. The specimen was embedded in snow.

TACHYS OVENSSENSIS, sp. nov.

Subovalis; nitidus; niger vel piceo-niger; mandibulis, abdomine, et macula magna ad vel ante elytrorum apicem posita, rufis; antennarum basi pedibusque testaceis; prothorace sat fortiter transverso, postice quam antice vix latiori, obsoleta canaliculato, postice utrinque impresso et mox ante basin transversim sulcato (sulco obscure punctulato), lateribus sat anguste marginatis antice fortiter rotundatis postice fere rectis, angulis posticis acute rectis fere subdentatis; elytris singulis striae 2 juxta suturam (2^a antice posticeque abbreviata, 1^a circum apicem continuata et in disco antrorsum producta) 2que juxta marginem lateralem profunde impressas ferentibus, in disco puncturis 2 setiferis instructis.

[Long. $1\frac{2}{3}$ - $1\frac{1}{2}$, lat. $\frac{3}{4}$ line.

Structurally near *T. Baldiensis* but with the apical joint of the maxillary palpi very evidently shorter, the prothorax narrower in proportion to the elytra and the elytra of much less oval form (less narrowed in front and with the sides more parallel). Owing to the sides of the prothorax being strongly rounded immediately behind the front that segment at a casual glance appears to be narrowed hindward, but in reality the base is slightly wider than the front margin. Usually the red spot on each elytron is large and round, placed a little before the apex, almost touching the suture and lateral margin, and very conspicuous; I have one specimen in which it is almost obsolete and another in which it is extended so that more than the apical third part of the elytra is red. The striae of the elytra are quite impunctate. The facies of this species and the next is quite that of *Bembidium*, but the recurved sutural stria and the structure of the anterior tibiae seem to place both the insects in *Tachys*.

Victoria; banks of the Ovens River.

TACHYS BRIGHTENSIS, sp.nov.

Subovalis ; nitidus ; niger, subænescens ; mandibulis, antennarum basi palpisque plus minus dilutioribus ; pedibus et elytrorum humeris maculaque subapicali testaceis ; prothorace ut *T. Ovensensis* ; elytris singulis strias 5 prope suturam (his antice et postice penitus oblitteratis, stria suturali circum apicem continuata et in disco antrorsum producta) 2que juxta marginem lateralem profunde impressas ferentibus, interstitio 3° puncturis setiferis 2 minus perspicuis instructo.

[Long. $1\frac{2}{3}$, lat. $\frac{1}{2}$ line.

I do not observe any structural difference between this species and *T. Ovensensis*, but the markings and sculpture of the elytra are quite distinct ; the sutural stria and the next two on each elytron are completely obliterated in the front quarter, and the 2nd and 3rd in the apical quarter also, and in the remaining portion are extremely strongly impressed, while the 4th and 5th reach further forward in front but are still more abbreviated behind ; thus there is a large lævigata space round the scutellum.

Victoria ; near Bright.

BEMBIDIUM VICTORIENSE, sp.nov.

Sat breve ; convexum ; sat nitidum ; ferrugineum, pectore piceo, antennarum basi (his extrorsum fuscis) palpis pedibusque pallide testaceis, elytrorum disco obscure infuscato humeris apiceque testaceis ; prothorace fortiter transverso, postice quam antice sat latiori, canaliculato, vix manifeste punctulato, postice utrinque impresso, lateribus anguste marginatis antice sat fortiter rotundatis postice fere parallelis, angulis posticis acute rectis ; elytris fortiter striatis, striis latera versus valde impressis apicem versus obsolescentibus, interstitiis sat convexis, latitudine majori mox pone basin posita.

[Long. $1\frac{4}{5}$, lat. $\frac{4}{5}$ line (vix).

The antennæ (set back) reach a little beyond the base of the elytra ; the frontal sulci are moderately strong and diverge somewhat hindward ; and there are two fine and somewhat equal carinæ

on either side near the eye, placed longitudinally ; there is a short but well defined longitudinal carina on either side of the prothorax close to the hind angle limiting externally the basal impressions which are fairly large ; the 7th, 8th and 9th elytral striæ are excessively deep, the 7th and 8th being sinuous, the 6th and 7th being obsolete at the base, the 8th joining the 9th at its base. The tarsi are somewhat stout and not very elongate, the basal joint of the hind tarsi being scarcely so long as the next 3 together. The apical joint of the maxillary palpi is extremely short and not very slender. There are two large setigerous punctures on either side of the apical ventral segment a little behind the apex.

I cannot place this species in any of the named groups (known to me) of *Bembidium*, nor do I know any species resembling it. The prothorax is not unlike that of *B. rufescens*, Guér., but the sculpture of the elytra is totally unlike the sculpture of that insect. The anterior tibiæ are much like those of a *Tachys*, but the sutural stria of the elytra is not recurved at the apex, though I am not sure that the apical portion of the 7th stria which is sinuous and a little deepened does not really represent an interrupted piece of a recurved stria,—so that this species seems to hover between *Bembidium* and *Tachys*.

Victorian Alps.

BEMBIDIUM SECALIOIDES, sp. nov.

Sat angustum ; sat elongatum ; nitidum ; supra nigrum, nonnullis exemplis capite prothoraceque obscure rufescentibus, subtus piceo-ferrugineum, palpis femoribusque pallide testaceis, antennis tibiis tarsisque sordide testaceis vel potius ferrugineis ; prothorace fortiter transverso, postice quam antice vix latiori, canaliculato, postice utrinque impresso, latitudine majori mox pone marginem anticum posita, sulco antico tranverso arcuato profunde impresso punctulato, lateribus sat anguste marginatis fortiter rotundatis, angulis posticis obtusis (apice summo subdentatis), basi retrorsum valde lobata ; elytris lævigatis, nihilominus utrinque stria

suturali, et (postice) stria submarginali, et foveis 3 longitudinaliter positis, profunde impressis.

[Long. $1\frac{4}{5}$ (vix), lat. $\frac{3}{8}$ line.

This is another species which does not seem to fall into any of the named groups known to me of *Bembidium*, or to have any very near ally; it might perhaps with some reason be treated as the type of a new genus. In general appearance it is extremely like the European *Trechus secalis*, Sturm, in miniature; but with the palpi of a *Bembidium*,—the apical joint nevertheless nearly as long as the penultimate though very slender and cylindric. Compared with *T. secalis*, the head scarcely differs except in the eyes being decidedly more prominent and the neck much more defined, the antennæ are exceedingly similar but perhaps a trifle longer in proportion, and the prothorax scarcely differs except in the basal lobe being stronger; the elytra are longer and more parallel-sided and of quite different sculpture. I observe that all the setæ on the upper surface are extremely long and slender. In the two examples before me (both males I think) the basal two joints of the anterior tarsi are only moderately dilated. The apical ventral segment is strongly transverse, and slightly emarginate at the apex; it does not bear any setiferous punctures, but its whole surface is sparsely studded with fine scratch-like punctures. The elytra not abbreviated and truncated at the apex will *inter alia* distinguish this insect from the South American *Thalassobius* which in some respects it approaches. The foveated elytra recall to mind *B. bipunctatum*, Linn., but in the present species the front fovea is nearer the base, and there is an additional one near the apex. It is to be noted that the basal lobe of the prothorax gives that segment the appearance of being narrowed behind, but it is not narrower across the *hind angles* than across the front.

Victoria; banks of the Ovens River.

N.B.—Besides the above-named new species of *Bembidiides* I have *Bembidium ocellatum*, Blackb., and *Tachys similis*, Blackb., and *Flindersi*, Blackb., all from the Victorian Alps.

STAPHYLINIDÆ.

STENUS AUSTRALICUS, sp. nov.

Nitidus; niger, femoribus basi rufo-testaceis; antennis sat elongatis, gracilibus, articulo 5° 4° subbreviori, capite prothorace sat breviori, multo latiori, inter oculos profunde excavato, inæquali, sat fortiter minus crebre punctulato; prothorace subcylindrico, æquali, quam latiori fere dimidio longiori, crasse nec crebre nec rugulose punctulato, latitudine majori ante medium posita, basin versus sat subito angustato; elytris prothorace sat latioribus (capiti latitudine subæqualibus), æque ac prothorax punctulatis; abdomine leviter gradatim retrorsum angustato, segmentis basi crenulatis subtiliter sparsim punctulatis (2ⁱ lateribus marginatis), tarsorum articulo 4° simplice [Long 2, lat. ? line.

Allied to *S. caviceps*, Fvl., but differently coloured and having the prothorax considerably longer than the head. In M. Fauvel's tabulation of the Australian *Steni* (Ann. Mus. Gen. 1878, pp. 501-2) it would fall under A. c. along with *caviceps*. From all the Queensland species described by Sir W. Macleay (which M. Fauvel was unable to include in his tabulation) this species differs widely in colouring and other characters.

Mountains of Victoria; near Wandiligong.

N.B.—It is perhaps worthy of note that I met with a specimen in the Victorian Alpine district which seems to agree with the description of the magnificent *S. maculatus*, MacL., (previously recorded only from Queensland and N.S. Wales).

BUPRESTIDÆ.

BUBASTES INCONSTANS, Blackb.

This species appears to be identical with *B. inconsistans*, Thoms. I described the insect on a specimen in the South Australian Museum labelled "*B. inconsistans*" without quotation of an author's name. I could not find that any species had been described under

that name,—unfortunately Thomson's "Typ. Bupr. App. I." in which "*inconsistans*" was described escaped notice by some accident in the Zoological Record for some years, and also escaped the notice of Mr. Masters in his "Cat. of the described *Coleoptera* of Australia." I imagined myself safe in adopting the MS. name attached to the specimen in question,—but now having obtained M. Thomson's paper I am satisfied that the two are identical. "*Inconstans*" is of course the more correct form, but "*inconsistans*" appears to have been the originally published one.

STIGMODERA FRENCHI, Blackb.

This species, described by me in the Trans. Roy. Soc. S.A. 1890, (p. 150) is evidently identical with *S. præcellens*, Kerremans (C. R. Soc. Ent. Belg.), described in a memoir read on Sept. 6, 1890. The question of priority will depend of course on the date of publication of the respective memoirs. The Vol. of the Transactions of the Royal Society S.A., containing my memoir was published a few days ago (December, 1890). As far as I know the Vol. of the Ent. Soc. Belg. for 1890 has not yet (Jan. 1891) been published.

LONGICORNES.

ANATISIS.

The fine species described below may I think be attributed to this genus, although its head is slightly more elongate and its mesosternum somewhat narrower than the corresponding parts in *A. laminosus*, Newm., and its antennæ with a series of short external as well as long internal branches, and an additional joint at the apex of the 11th joint slightly longer than and of similar form to the internal branch of the 11th joint, might perhaps justify the creation of a new generic name. This species has the *facies* (apart from the antennæ), style of colouring, pubescence, &c., of a *Strongylurus*.

ANATISIS FRENCHI, sp.nov.

♂ Ferrugineus; pilis fulvis vestitus; prothorace (bivittatim et basin mediam versus), scutello, prosterni mesosterni et (minus

conspicue) metasterni lateribus, dense niveo-pilosis; elytris (his postice fortiter hispinosis) medium versus transversim obsolete piceo-fasciatis; antennis 12-articulatis, articulis 3-11 ramis binis (internis elongatis, externis brevibus) instructis.

♀ latet.

[Long. 16, lat. 4 lines.

The similarity in structure of the antennæ of this insect to those of *Distichocera* is noteworthy, but its very coarsely granulated eyes and many other characters of course separate it widely from that genus. The sculpture of the upper surface is very much as in *A. laminosus*, Newm.

Queensland; forwarded to me for description by C. French, Esq.

N.B.—I am all the more averse to giving this insect a new generic name because the names of genera closely allied to it are already somewhat confused. *Petalodes* was formed on a supposed (but non-existent) difference from *Piesarthrus* in antennal structure,—the male of the latter being unknown at the time. *Petalodes* however was a preoccupied name and *Analisis* was substituted by Mr. Pascoe. If every slight difference in structure requires a new generic name the genera of *Strongylurides* with pectinated or flabellated antennæ will be equally numerous with the species.

REVISION OF AUSTRALIAN LEPIDOPTERA.

BY E. MEYRICK, B.A., F.Z.S.

IV.

A third family of the Geometrina, the *Hydriomenidae*, are here presented. I have hitherto called this family by the name *Larentiadae*, but my recent investigations on the European species have led to my recognising that the generic terms *Larentia* and *Cidaria* must be dropped, and the name of the family altered in accordance.

The number of species which I am able to give is 91, but I am disposed to think that many more remain to be discovered. As a rule, the species of this family inhabit temperate climates; very few seem to occur in the northern parts of Australia, but the number increases continually as one goes south; they are plentiful in Tasmania, and my visit to Mount Kosciusko furnished many new species. In New Zealand also the family is largely developed.

Xanthorhoë (with *Dasyuris*) may be taken as the earliest form, of which genera 14-19 are developments; of these *Hydriomena* is dominant, and gives rise to the *Asthena* group and *Lobophora* group, besides smaller offshoots, as *Scordylia*. From *Lobophora* originates the *Pasiphila* group, of which genera 2-5 form a section specially characteristic of Australia and New Zealand.

As the markings of the species consist of a series of transverse lines, variously modified, and the colouring is usually very confused and ill-defined, the descriptions require close attention for identification, and any structural points, such as the length of the palpi (expressed hereinafter in terms of the breadth of the eye) or of the ciliations or pectinations of the antennæ (expressed in terms of the breadth of the stalk) should be carefully observed. Guénée's descriptions, which lack precision, are here not always identifiable.

The usual structure of the *Geometrina* is assumed throughout, unless specially stated; e.g., veins 7 and 8 of forewings rise out of 9, unless an apparent exception is expressly affirmed.

HYDRIOMENIDAE.

Forewings with vein 10 anastomosing with 9, rising out of or anastomosing with 11. Hindwings with vein 5 present, 8 anastomosing with upper margin of cell from near base to near end of cell.

The anastomosis of veins 9, 10, 11 of forewings forms an auxiliary cell, which is hereinafter called the areole; if 10 rises out of 11, the areole is simple, if it rises separate, double. Vein 6 of the forewings sometimes rises out of 7, and I formerly employed this as a distinctive point, but on examination of many specimens I find that it is so often variable within the limits of the same species that it is not available in this family. Rarely the posterior wall of the areole is obsolete through non-development; this apparent abnormality is explained beneath (cf. *Hydriomena phaedra*).

The following is a tabulation of the genera:—

- | | |
|--|---------------------------|
| 1. Thorax roughly hairy beneath..... | 19. <i>Dasyuris</i> . |
| Thorax not hairy beneath..... | 2. |
| 2. Posterior tibiae without median spurs..... | 3. |
| Posterior tibiae with median spurs.... | 5. |
| 3. Tongue absent; antennae in ♂ pectinated | 16. <i>Anomocentris</i> . |
| Tongue present; antennae in ♂ simple.... | 4. |
| 4. Face with scale-cone, hindwings in ♂ simple. | 1. <i>Gymnoscelis</i> . |
| Face smooth; hindwings in ♂ lobed and folded | 6. <i>Remodes</i> . |
| 5. Antennae in ♂ pectinated | 6. |
| Antennae in ♂ simple.. .. | 7. |
| 6. Forewings with vein 7 out of 8. .. | 18. <i>Xanthorhoe</i> . |
| Forewings with vein 7 separate from 8. .. | 17. <i>Acodia</i> . |
| 7. Areole simple..... | 8. |
| Areole double..... | 13. |

- | | |
|---|--------------------------|
| 8. Forewings with vein 11 running into 12... | 9. |
| Forewings with vein 11 not running into 12 | 11. |
| 9. Forewings in ♂ with rough projecting scales
or swelling on costa..... | 4. <i>Phrissogonus</i> . |
| Forewings in ♂ without costal rough scales
or swelling | 10. |
| 10. Hindwings in ♂ with distorted impression
or flocculent discal patch..... | 5. <i>Microdes</i> . |
| Hindwings in ♂ without impression or
flocculent patch..... | 3. <i>Pasiphila</i> . |
| 11. Face quite smooth..... | 11. <i>Euchoeca</i> . |
| Face with projecting scales..... | 12. |
| 12. Forewings with erect discal scale-tuft..... | 2. <i>Mesoptila</i> . |
| Forewings smooth..... | 13. <i>Scordylia</i> . |
| 13. Hindwings in ♂ with innermarginal lobe | 7. <i>Lobophora</i> . |
| Hindwings in ♂ without lobe | 14. |
| 14. Hindwings in ♂ with a vein absent..... | 15. |
| Hindwings in ♂ with all veins present..... | 16. |
| 15. Hindwings in ♂ with vein 4 absent..... | 8. <i>Heterochasta</i> . |
| Hindwings in ♂ with vein 6 absent..... | 9. <i>Polyclysta</i> . |
| 16. Face smooth..... | 12. <i>Asthenia</i> . |
| Face with projecting scales.....,..... | 17. |
| 17. Forewings in ♂ with hairy groove on vein 1 | 10. <i>Protaulaca</i> . |
| Forewings in ♂ without groove..... | 18. |
| 18. Hindwings in ♂ with discal patch of
modified scales..... .. | 15. <i>Melitulias</i> . |
| Hindwings in ♂ without modified scales... | 14. <i>Hydriomena</i> . |

1. GYMNOSCELIS, Mab.

Face with short cone of scales. Antennæ in ♂ ciliated. Palpi moderate, porrected, rough-scaled. Posterior tibiæ in both sexes without median spurs. Forewings with areole simple, 11 sometimes running into 12. Hindwings with veins 6 and 7 stalked.

1. *Gymn. erymna*, Meyr.

(*Doleroseles erymna*, Meyr., Trans. Ent. Soc. Lond. 1886, 192 (*Eupithecia*), ib. 1889, 480.)

♂. 16-18 mm. Antennæ with projecting scales at joints, ciliations 1. Forewings elongate-triangular; 11 free; whitish irregularly mixed with grey and with an irregular very pale green suffusion, sometimes also mixed with reddish; numerous more or less distinct subdentate curved darker grey lines, sprinkled with blackish; two before middle more strongly marked, bent near costa; a well-marked blackish line from $\frac{2}{3}$ of costa obliquely outwards, forming almost an acute angle in middle of disc towards hindmargin, thence running twice sinuate to $\frac{2}{3}$ of inner margin: cilia pale grey, basal half barred with dark grey and whitish. Hindwings rather narrow, hindmargin rounded, slightly waved; 3 and 4 from a point; colour and markings as in forewings, but postmedian black line rather strongly indented above angulation.

Queensland; three specimens. Occurs also in New Guinea and some of the South Pacific islands as far as Tonga.

2. *MESOPTILA*, n.g.

Face with small cone of scales. Antennæ in ♂ —?. Palpi moderate, porrected, rough-scaled. Abdomen slightly crested. Posterior tibiae with all spurs present. Forewings with central tuft of erect scales in disc, areole simple. Hindwings with veins 6 and 7 stalked.

Differs from *Eupithecia* by the discal scale-tuft of forewings, but probably the ♂ will show additional characters.

2. *Mes. compsodes*, n.sp.

♀. 17 mm. Head, palpi, antennæ, and thorax pale ochreous. Abdomen pale ochreous, densely irrorated with black except at base and apex. Legs whitish-ochreous, anterior pair partially suffused with dark fuscous. Forewings rather elongate-triangular, costa posteriorly moderately arched, hindmargin bowed, waved,

light reddish-ochreous, with numerous very obscure suffused pale whitish-ochreous curved transverse lines; one about $\frac{1}{3}$, and three beyond middle, are partially marked with black; a tuft of erect blackish scales in middle of disc; a small triangular blackish mark on costa at $\frac{2}{3}$; a nearly straight cloudy whitish subterminal line, preceded on costa by a blackish suffusion, and suffusedly margined with blackish towards lower extremity, where it becomes more conspicuous; an interrupted blackish hindmarginal line: cilia ochreous-whitish, somewhat sprinkled with blackish. Hindwings with hindmargin nearly straight, crenulate; fuscous-whitish, towards inner margin whiter and marked with incomplete cloudy reddish-ochreous lines sprinkled with blackish, reaching $\frac{1}{3}$ across wing; hindmarginal line and cilia as in forewings.

Sydney, New South Wales; one specimen on a lamp in August.

3. PASIPHILA, Meyr.

Face with cone of scales. Antennæ in ♂ ciliated or naked. Palpi moderate or rather long, porrected, rough-scaled. Abdomen slightly crested. Posterior tibiæ with all spurs present. Forewings with areole simple, 11 running into 12. Hindwings with veins 6 and 7 stalked.

Characteristic of New Zealand, where about ten species occur, but the following species is only yet known from Australia.

3. *Pas. filata*, Gn.

(*Eupithecia filata*, Gn. X, 353; *Phibalapteryx rubroferrata*, Walk. 1341.)

♂♀. 19-21 mm. Head, palpi, and thorax mixed with fuscous-reddish, whitish-ochreous, and dark fuscous: palpi in ♂ 2, in ♀ 3. Antennæ in ♂ shortly ciliated ($\frac{1}{2}$). Forewings triangular, hindmargin bowed; ochreous-whitish, densely irrorated with fuscous-reddish, appearing to form numerous curved waved transverse lines, partially marked with blackish on veins; median band sometimes suffused with fuscous, or more rarely on lower half with white; its anterior edge running from $\frac{2}{3}$ of costa to $\frac{2}{3}$ of inner

margin, concave; its posterior edge running from $\frac{2}{3}$ of costa to $\frac{2}{3}$ of inner margin, rather sharply angulated near costa, thence slightly sinuate, marked with a row of black dots, and generally followed by a well-marked pale or whitish double line; a somewhat darker suffused spot towards hindmargin above middle; an interrupted blackish hindmarginal line: cilia ochreous-whitish, somewhat mixed with reddish-ochreous and spotted obscurely with grey towards base. Hindwings with hindmargin dentate, rather deeply concave above middle; ochreous-whitish, with numerous straight fuscous-reddish transverse lines, somewhat bent near costa, sometimes marked with black on veins; posterior edge of median band obtusely angulated near costa, marked in ♂ with a thick black streak, in ♀ with a row of black dots, followed by a more distinct pale double line; cilia light reddish-ochreous, tips more whitish.

Sydney and Mount Kosciusko (5700 feet), New South Wales; Melbourne, Victoria; Hobart and Deloraine, Tasmania; from October to January, common.

4 PHRISOGONUS, Butl.

Face with small cone of scales or quite smooth. Antennæ in ♂ ciliated or naked. Palpi moderate or short, porrected, more or less rough-scaled. Abdomen slightly crested. Posterior tubæ with all spurs present. Forewings in ♂ with swelling or tuft or rough projecting scales on costa, vein 5 sometimes distorted or absent; areole simple, 11 running into 12. Hindwings with veins 6 and 7 stalked.

Confined to Australia, except that one species ranges into New Zealand. In the following tabulation the species are separated by characters common to both sexes, although the ♂ and ♀ are often very dissimilar in appearance; but the structural variations in the forewings of the ♂, which are different for each species, afford an easier test.

- | | |
|---|--------------------------|
| 1. Transverse lines mainly reddish-fuscous..... | 7. <i>pyretodes</i> . |
| Transverse lines mainly grey..... | 2. |
| 2. Lines of hindwings distinct near inner margin only..... | 8. <i>laticostatus</i> . |
| Lines of hindwings equally distinct almost throughout..... | 3. |
| 3. Posterior margin of median band of hindwings angulated in middle.. .. | 4. |
| Posterior margin of median band of hindwings not angulated in middle..... | 6. <i>insigillatus</i> . |
| 4. Supra-median sinuation of posterior margin of median band of forewings finely margined with white..... | 5. <i>denotatus</i> . |
| Supra-median sinuation of posterior margin of median band of forewings not margined with white | 4. <i>catastreptes</i> |

4. *Phriss. catastreptes*, n.sp.

♂♀. 15-16 mm. Head, palpi, thorax, and abdomen pale greyish-ochreous, irrorated with blackish; palpi 2. Antennæ pale greyish-ochreous, in ♂ shortly ciliated ($\frac{1}{2}$), with black projecting scales at joints. Legs grey, banded with ochreous-whitish. Forewings triangular, costa in ♂ towards base rather abruptly arched and roughened with short projecting scales, hindmargin bowed, oblique, slightly sinuate above middle; whitish-ochreous, obscurely suffused with dull reddish on median band, and pale grey-greenish towards hindmargin; numerous curved waved cloudy blackish-grey transverse lines; outer edge of median band running from $\frac{3}{8}$ of costa to $\frac{3}{8}$ of inner margin, shortly angulated outwards beneath costa and again in middle; in ♂ a pale ochreous longitudinal streak beneath costa from $\frac{2}{5}$ to $\frac{4}{5}$; subterminal line pale, preceded by a darker shade, and forming a small pale spot in middle; a blackish interrupted hindmarginal line: cilia pale whitish-ochreous, suffusedly barred with dark grey. Hindwings with hindmargin unevenly rounded, crenulate, concave above middle; colour and markings

as in forewings, but outer edge of median band more blackish on lower half.

Sydney, New South Wales; in September, November, and June, common on the fence of the Botanical Gardens, but hitherto unobserved elsewhere.

5. *Phriss. denotatus*, Walk.

(*Scotosia denotata*, Wulk. 1361; *Phibalapteryx parvulata*, ib. 1721; *Phrizogonus denotatus*, Meyr., Trans. N.Z. Inst. 1887, 53; ? *Eupithecia testulata*, Gn. X, 352.)

♂♀. 15-19 mm. Palpi in ♂ 2, in ♀ 2½, dark fuscous. Antennae in ♂ stout, naked. Forewings with costa in ♂ moderately arched, with a small glandular dilation beyond middle, beneath which is a naked transversely striated longitudinal mark between veins 10 and 12, these veins being somewhat distorted, costa in ♀ gently arched, hindmargin bowed; rather dark fuscous or grey, with numerous very obscure waved darker transverse lines, more or less marked with black on veins; a few white scales indicating paler lines; sometimes one or two irregular whitish-ochreous fasciae towards base, or basal area suffused with light reddish-ochreous, posterior edge of median band from before $\frac{2}{3}$ of costa to $\frac{1}{3}$ of inner margin, more or less marked with black, obtusely angulated in middle, with a marked sinuation above angle, rendered conspicuous by a white crescentic mark following it, sometimes followed by a whitish-ochreous or pale reddish-ochreous patch: cilia pale fuscous, base spotted with darker. Hindwings with hindmargin unevenly rounded, crenulate, sinuate above middle, fuscous, with waved darker lines; posterior edge of median band marked with blackish, angulated in middle; cilia as in forewings.

Glen Innes (3500 feet), Newcastle, Sydney, Bathurst, and Cooma, New South Wales; Deloraine, Tasmania; Mount Lofty and Port Lincoln, South Australia, in August and from November to February, generally common. Also occurs commonly in New Zealand. I cannot think Guénée's *testulata* really referable here, but his description is insufficient for determination.

6. *Phriss. insigillatus*, Walk.

(*Eupithecia insigillata*, Walk. 1245.)

♂♀. 17-19 mm. Head, palpi, thorax, and abdomen ochreous-whitish, finely sprinkled with blackish; palpi about 1. Antennæ grey-whitish, in ♂ ciliated ($\frac{1}{2}$). Legs whitish, anterior pair partially suffused with dark fuscous. Forewings elongate-triangular, costa gently arched, in ♂ on upper surface with a deep circular impression immediately below costa in middle, surrounded with dense rough more or less erect hairs, hindmargin bowed, very oblique; veins in ♂ partially distorted, 4 and 5 anteriorly approximated; grey-whitish, with numerous curved waved cloudy grey or reddish-grey transverse lines, partially marked with black on veins; margins of median band in ♂ obsolete, in ♀ slenderly blackish, distinct, anterior running from $\frac{1}{3}$ of costa to $\frac{1}{4}$ of inner margin, curved, posterior running from $\frac{3}{5}$ of costa to $\frac{2}{3}$ of inner margin, obtusely angulated near costa and again in middle; in ♂ a slender curved whitish-ochreous longitudinal streak in disc from middle to $\frac{5}{8}$, margined beneath with blackish; an interrupted blackish hindmarginal line: cilia grey-whitish, obscurely barred with grey. Hindwings with hindmargin rounded, crenulate on lower half; grey-whitish, with numerous nearly straight waved grey or reddish-grey transverse lines, somewhat bent towards costa; margins of median band slenderly blackish, anterior near base, straight, posterior obtusely angulated near costa, otherwise straight; hindmarginal line and cilia as in forewings.

Glen Innes (3500 feet) and Sydney, New South Wales; Melbourne, Victoria; Mount Lofty, South Australia; Albany Perth, and York, West Australia; from August to November, in February, and April, common.

7. *Phryss. pyretodes*, n.sp.

♂. 22-23 mm. Head, palpi, thorax, and abdomen whitish-ochreous, tinged with fuscous-reddish and sprinkled with black; palpi $1\frac{2}{3}$. Antennæ whitish-ochreous, ciliated ($\frac{1}{2}$). Legs dark

fuscous, posterior pair whitish-ochreous. Forewings rather elongate-triangular, costa gently arched, with a fringe of long projecting hairs on anterior half and a ridge of erect curled hairs on posterior half; vein 5 absent; whitish-ochreous, suffusedly and irregularly irrorated with reddish-fuscous and a few black scales; anterior edge of median band indicated by a row of blackish marks running from $\frac{2}{3}$ of costa to $\frac{1}{3}$ of inner margin, acutely angulated above middle, space between this and base sometimes suffused with darker reddish-fuscous mixed with black and produced as a thick streak above middle of disc to hindmargin; posterior margin of median band formed by a well-marked reddish-fuscous line marked with black on veins, running from $\frac{2}{3}$ of costa to before $\frac{2}{3}$ of inner margin, shortly indented beneath costa, with some white scales in indentation, rather acutely angulated above middle; lower half of median band sometimes without reddish irroration; a blackish hindmarginal line: cilia whitish-ochreous, mixed with light fuscous-reddish. Hindwings with hindmargin unevenly rounded, crenulate, concave towards middle, pale whitish-ochreous, towards inner margin marked with short waved fuscous-reddish lines, and a short reddish streak marked with black beyond middle, reaching $\frac{1}{3}$ across wing; hindmarginal line and cilia as in forewings.

♀. 19-22 mm. Forewings with costa gently arched; whitish-ochreous, more whitish in disc, with numerous curved waved cloudy reddish-fuscous lines, partially marked with black on veins; basal $\frac{2}{3}$ sometimes much suffused with blackish; posterior edge of median band well-marked by a series of small black wedge-shaped spots on veins, from before $\frac{2}{3}$ of costa to before $\frac{2}{3}$ of inner margin, obtusely angulated near costa and again more sharply in middle; an interrupted black hindmarginal line: cilia light reddish-fuscous, basal half barred with whitish-ochreous. Hindwings with colour and markings as in forewings, but lines obsolete near costa.

Newcastle and Sydney, New South Wales; Melbourne, Victoria, Georges Bay, Tasmania, in October and December, five specimens. I am not absolutely certain that these very dissimilar sexes are rightly referred together, but it seems highly probable.

8. *Phriss. laticostatus*, Walk.

(*Larentia laticostata*, Walk. 1196; *Scotosia canata*, ib. 1357, Butl., Ann. Mag. N.H. 1882, 94.)

♂♀. 16-18 mm. Head, palpi, thorax, and abdomen grey-whitish irrorated with dark grey; palpi in ♂ $1\frac{1}{2}$, in ♀ $1\frac{3}{4}$. Antennæ grey-whitish, in ♂ ciliated (1). Legs dark grey, posterior pair grey-whitish. Forewings triangular, costa in ♂ moderately arched, bent and protuberant at $\frac{1}{3}$, with a compact projecting tuft of hair scales on protuberance, in ♀ gently arched, hindmargin slightly rounded, oblique; grey-whitish, with numerous curved waved cloudy dark grey transverse lines, sprinkled with black; anterior edge of median band marked by a slightly curved blackish line mixed with ochreous-brown, from $\frac{2}{5}$ of costa to $\frac{2}{5}$ of inner margin, more conspicuous in ♀; posterior edge of median band more or less marked with black, running from before $\frac{3}{8}$ of costa to $\frac{3}{8}$ of inner margin, upper $\frac{3}{8}$ rather strongly curved outwards and forming two slight angles, with an indentation on submedian fold, on upper half partially preceded by an ochreous-brown suffusion; an interrupted black hindmarginal line: cilia grey-whitish, mixed with grey, forming obscure bars. Hindwings with hindmargin rounded; in ♂ grey-whitish, in ♀ pale whitish-grey, marked with numerous short grey lines towards inner margin; in ♂ a large somewhat semioval patch of black irroration extending along costa from $\frac{1}{3}$ to near apex, and reaching nearly half across wing.

Duaringa, Queensland; Glen Innes (4500 feet), Sydney, Blackheath, Bathurst, and Cooma, New South Wales; Melbourne and Warragul, Victoria; Hobart, Tasmania; Mount Lofty and Port Lincoln, South Australia; Carnarvon, Geraldton, and Albany, West Australia; from August to January, very common generally.

5. MICRODES, Gn.

Face with small cone of scales. Antennæ in ♂ naked or ciliated. Palpi long, porrected, rough-scaled. Posterior tibiae with all spurs present. Forewings with areole simple, 11 running into 12.

Hindwings in ♂ with distorted impression or flocculent discal patch; veins 6 and 7 stalked.

Probably confined to Australia. The ♂s are very easily distinguished by the peculiar characters of the hindwings, but the ♀s of the different species are extremely like one another; I am not sure whether the subjoined tabulation is always applicable.

- | | |
|---|--------------------------|
| 1. Forewings with thick black basal streak.... | 10. <i>melanocasta</i> . |
| Forewings without black streak | 2. |
| 2. Groundcolour grey, posterior edge of median band distinctly projecting above and below middle..... | 11. <i>squamulata</i> . |
| Groundcolour grey-whitish, posterior edge of median band nearly straight | 9. <i>villosata</i> . |

9. *Micro villosata*, Gn.

(*Microdes villosata*, Gn. X, 297, pl. xv, 8; *Panagra mixtaria*, Walk. 1663; *Microdes toriata*, Feld. pl. cxxxi, 34.

♂♀. 19-20 mm. Head, palpi, thorax, and abdomen whitish irrorated with grey. Antennæ whitish, in ♂ naked. Legs dark grey, posterior pair whitish. Forewings triangular, costa rather strongly arched near base, hindmargin slightly bowed, little oblique; veins in ♂ somewhat distorted, with a naked space beneath between veins 6 and 7 at base; grey-whitish, irrorated with rather dark grey, forming numerous waved nearly straight transverse lines, on anterior $\frac{2}{3}$ somewhat bent near costa, partially marked with blackish on veins: cilia grey whitish, with a basal row of grey spots. Hindwings in ♂ small, narrow, with a large circular impression towards hindmargin in middle, surrounded with irregular rough hairs, hindmargin strongly emarginate in middle, veins much distorted, in ♀ normal, hindmargin rounded; in ♂ grey-whitish, impression blackish, surrounding hairs whitish-ochreous; in ♀ pale grey; cilia whitish.

Sydney, New South Wales; Melbourne and Casterton, Victoria; Mount Lofty, South Australia; Albany, West Australia; in July, and from September to November, common.

10. *Micr. melanocausta*, n.sp.

♂♀. 20-22 mm. Head, palpi, thorax, and abdomen whitish-ochreous, finely sprinkled with dark grey and blackish, patagia with a black mark beneath shoulders. Antennæ grey-whitish, in ♂ ciliated ($\frac{2}{3}$). Legs dark fuscous, apex of joints and posterior pair whitish. Forewings triangular, costa gently arched, more strongly near base, hindmargin rather bowed, somewhat oblique; veins 4 and 5 in ♂ somewhat approximated; light grey, faintly brownish and rosy-tinged, sprinkled with whitish, and with numerous faintly indicated waved darker lines, partially marked with blackish on veins; a thick cloudy black longitudinal streak above inner margin from base to $\frac{1}{3}$; margins of median band obscurely indicated by blackish dots, anterior from $\frac{2}{5}$ of costa to $\frac{2}{5}$ of inner margin, nearly rectangularly angulated in middle, posterior from $\frac{2}{3}$ of costa to $\frac{2}{3}$ of inner margin, almost acutely angulated above middle; median band traversed by a thick longitudinal black streak below middle, extended as a blackish suffusion along lower half of anterior margin of band: cilia whitish-grey, with a somewhat darker brownish-tinged line. Hindwings in ♂ small, narrow, terminally distorted and emarginate at apex, so that central third of hindmargin appears to form a broad projection, with a terminal depression margined above with rough scales, in ♀ normal, hindmargin rounded; in ♂ veins 2 and 3 stalked, 5 very widely remote, approximated to 6; in ♂ whitish-ochreous, posterior half of terminal depression blackish; in ♀ light grey; cilia whitish.

Deloraine, Tasmania; in November, two specimens.

11. *Micr. squamulata*, Gn.

(*Microdes squamulata*, Gn. X. 298.)

♂♀. 18-20 mm. Head, palpi, and thorax pale greyish-ochreous, densely irrorated with blackish-grey. Antennæ grey-whitish, in ♂ ciliated ($\frac{1}{3}$). Abdomen in ♂ dark grey, central third sharply whitish-ochreous; in ♀ grey-whitish irrorated with dark grey. Legs blackish-grey, apex of joints whitish. Forewings triangular, costa gently arched, more strongly near base, hindmargin bowed,

somewhat oblique; grey, partially ochreous or brownish-tinged, sprinkled with whitish and blackish, with numerous irregular waved cloudy darker lines, partially marked with blackish on veins; margins of median band distinctly darker, anterior from $\frac{1}{3}$ of costa to $\frac{2}{3}$ of inner margin, rather strongly curved, posterior from $\frac{2}{3}$ of costa to $\frac{1}{3}$ of inner margin, irregularly sinuate so as to project shortly outwards above and below middle, followed by a more or less distinct paler double line: cilia brownish-grey mixed with whitish, base obscurely barred with darker. Hindwings normal, hindmargin rounded; in ♂ whitish-grey, hindmargin suffused with grey, with an elongate-oval patch of flocculent whitish-ochreous scales in disc somewhat above middle, extending from $\frac{1}{4}$ to $\frac{3}{4}$; in ♀ wholly pale grey; cilia whitish-grey.

Melbourne, Victoria; Albany, West Australia; from October to December, common.

6. REMODES, Gn.

Face smooth. Antennæ stout, compressed, in ♂ naked or minutely ciliated. Palpi long, porrected, loosely scaled. Posterior tibiae in ♂ without spurs, in ♀ with median spurs absent, posterior tarsi in ♂ with rough scales towards base. Forewings with areole simple. Hindwings with veins 3 and 4 stalked, 6 and 7 stalked; in ♂ with inner margin twice or thrice lobed and folded into pockets, 8 anastomosing not with cell but with 7 beyond cell, veins much distorted.

A small genus of Indo-Malayan origin. The species are at present imperfectly understood for want of material.

- | | |
|--|--------------------------|
| 1. Antennæ whitish-ochreous, partially greyish-tinged..... | 12. <i>malaca</i> . |
| Antennæ blackish..... | 2. |
| 2. Patagia black except shoulders..... | 14. <i>lichenias</i> . |
| Patagia greenish..... | 13. <i>melanoceros</i> . |

12 *Rem malaca*, n.sp.

♂♀. 30 36 mm. Head, palpi, thorax, and abdomen whitish ochreous tinged with greenish. Shoulders with a blackish mark

abdomen in ♂ with a slender pencil of hairs on each side near base, and a much shorter one below middle. Antennæ whitish-ochreous, terminal half greyish-tinged, in ♂ ciliated ($\frac{1}{6}$). Legs whitish-ochreous, anterior tibiae pale greenish, apex dark grey, with a small projection of scales, posterior legs in ♂ relatively short, somewhat distorted, tibiae with tuft of hairs in furrow. Forewings very elongate-triangular, costa rather strongly arched, hindmargin bowed, extremely oblique, with a deep contorted indentation above anal angle, and a smaller contortion at angle; pale greenish-ochreous, with numerous curved waved olive-greenish transverse lines, marked here and there with a few blackish-grey scales; a slender clear median space, including an olive-greenish transverse discal mark; a row of small cloudy blackish spots on a transverse line at $\frac{2}{3}$; two short longitudinal blackish-grey marks between veins towards hindmargin above middle; a hindmarginal row of small well-defined blackish spots on veins: cilia whitish, base whitish-ochreous. Hindwings in ♂ very small, inner margin thrice lobed and folded so as to form four more or less complete contorted pockets; in ♂ whitish-ochreous, inner and hindmargin more or less suffused with dark fuscous; in ♀ grey, paler towards base; cilia whitish-ochreous, round apex fuscous.

Queensland; three specimens.

13. *Rem. melanoceros*, Meyr.

(*Remodes melanoceros*, Meyr., Trans. Ent. Soc. Lond. 1889, 481.)

♀. 30 mm. Head and thorax light dull green, with a white spot behind eyes. Palpi dull green, base white beneath. Antennæ blackish-grey, extreme base ochreous-whitish. Forewings with costa rather strongly arched, hindmargin strongly rounded, very oblique; pale dull whitish-green, with numerous waved curved deeper green transverse lines, partially marked with black; a black discal dot before middle; a hindmarginal series of large black dots: cilia ochreous-whitish. Hindwings small, hindmargin rounded; whitish-ochreous-grey.

Duaringa, Queensland, in August; also from New Guinea; three specimens.

14. *Rem. lichenias*, n.sp.

♀. 23-25 mm. Head white, with a greenish bar on face, and a black bar between antennæ. Palpi dull green, beneath sharply black, base white. Antennæ blackish, with a fine white longitudinal line. Thorax white, greenish-tinged on back, patagia black except on shoulder. Abdomen whitish, with a black bar near base. Legs white, anterior femora and tibiæ black. Forewings rather elongate-triangular, costa strongly arched on posterior half, hindmargin rather strongly rounded, oblique; silvery-white, sprinkled with grey in disc, with about twelve irregularly curved waved cloudy lines, first pale greenish, black on costa; second black, sharply angulated near costa; third pale greenish, mixed with black near costa, and marked with a black elongate spot on inner margin; fourth black; fifth black, forming small spots on costa and fold, and a greenish spot on inner margin; a curved oblique-transverse black mark in disc beyond this, sixth black, interrupted with pale green beneath costa, in middle, and on inner margin, connected near lower extremity by a black oblique bar with anal angle; seventh indefinite, greenish mixed with blackish, eighth black, somewhat bent above middle; ninth pale greenish mixed with blackish; tenth and eleventh mostly confluent, pale green, with extremities black, and interrupted by a double black bar above middle; twelfth black, somewhat mixed with greenish, a hindmarginal row of black spots: cilia silvery-white, base greyish. Hindwings small, hindmargin rounded; pale grey, darker towards hindmargin; cilia grey-whitish.

Sydney, New South Wales, in August and November, on fences; four specimens.

7. *LOBOPHORA*, Curt.

Face with short cone of scales. Antennæ in ♂ ciliated. Palpi moderate, porrected, rough-scaled. Posterior tibiæ with all spurs present. Forewings with areole double. Hindwings with veins 6 and 7 stalked or separate, neuration in ♂ sometimes distorted; in ♂ with a more or less developed lobe on inner margin.

A small genus of the northern hemisphere, from which (as above restricted) the following species does not seem to differ structurally, though in superficial appearance it rather recalls *Pasiphila*.

15. *Lob. delogramma*, Meyr.

(*Cephalissa delogramma*, Meyr., Trans. Ent. Soc. Lond. 1886, 195.)

♂♀. 16-22 mm. Head, thorax, and abdomen whitish-ochreous, mixed with reddish and blackish; abdomen with a blackish ante-median band. Palpi 2, blackish or reddish-fuscous. Antennæ grey (in ♂ broken). Forewings triangular, hindmargin in ♂ entire, in ♀ waved, rather bowed, oblique; whitish-ochreous, suffusedly irrorated with fuscous-reddish, forming cloudy irregular waved lines, partially marked with black on veins; a curved black line very near base; a double curved black line from $\frac{1}{3}$ of costa to $\frac{1}{3}$ of inner margin; a blackish line, marked with wedgeshaped black spots, from $\frac{2}{3}$ of costa to $\frac{3}{4}$ of inner margin, obtusely angulated in middle, shortly indented twice on upper half, and twice more deeply and angularly on lower half; a rather dark fuscous suffusion towards costa before apex, and a larger suffused patch towards hindmargin above middle; cilia with basal half whitish-ochreous barred with dark grey, terminal half grey-whitish. Hindwings with hindmargin in ♂ hardly rounded, inner marginal lobe formed by a deep indentation in hindmargin above anal angle, inner margin slightly concave; ochreous-grey-whitish irrorated with dark grey, forming faint darker lines; one at $\frac{3}{4}$ more blackish towards inner margin; cilia whitish-grey, basal half on lower $\frac{2}{3}$ of hindmargin irrorated with dark grey.

Brisbane, Queensland; one specimen received from Dr. Lucas. This specimen is a ♂, and I cannot positively assert that it is specifically identical with the two original specimens (both ♀) which I described from Fiji and Tonga, but on the whole it appears to me highly probable.

8. *HETEROCHASTA*, n.g.

Face with slightly projecting scales. Antennae in ♂ shortly ciliated. Palpi rather short, porrected, loosely scaled. Posterior tibiae with all spurs present. Forewings in ♂ with tuft of hairs from inner margin near base; areole double. Hindwings in ♂ with vein 4 absent (coincident with 3), 6 and 7 stalked.

Nearly allied to the following genus.

16. *Het. conglobata*, Walk.

(*Cidaria conglobata*, Walk. 1411.)

♂. 27 mm. Head, palpi, and thorax fuscous, mixed with pale greyish-ochreous and dark fuscous; palpi $1\frac{1}{2}$, terminal joint very short. Antennae fuscous, ciliations $\frac{1}{2}$. Forewings triangular, hindmargin bowed, oblique; ochreous-grey-whitish, sprinkled with grey, with numerous cloudy waved dark fuscous transverse lines; a basal patch suffused with light fuscous, its edge running from $\frac{1}{2}$ of costa to $\frac{1}{4}$ of inner margin, convex; a ferruginous line near beyond this; median band fuscous, enclosing a clear space on upper half, anterior edge running from $\frac{2}{3}$ of costa to middle of inner margin, partially marked with blackish, almost straight, posterior edge running from before $\frac{3}{4}$ of costa to $\frac{2}{3}$ of inner margin, upper half somewhat curved outwards, with a rather strong sinuation above middle, partially marked with blackish, more strongly on sinuation; a dark grey discal dot in clear median space; a double ferruginous line before pale subterminal line; an oblique cloudy blackish streak from apex, interrupted by subterminal line; a hindmarginal series of small subquadrate blackish spots arranged in pairs: cilia fuscous-whitish, base and obscure bars ochreous-brownish. Hindwings with hindmargin rounded, waved; whitish-fuscous, hindmargin darker; a cloudy dark fuscous hindmarginal line, forming darker spots on each side of veins; cilia whitish, base light fuscous.

Sydney, New South Wales; one specimen bred in October, but the record of the larva was lost. The British Museum has one specimen.

9. POLYCLYSTA, Gn.

Face with small cone of scales. Antennæ in ♂ shortly ciliated. Palpi moderate, porrected, loosely scaled. Posterior tibiae with all spurs present. Forewings with areole double. Hindwings in ♂ with vein 6 absent (coincident with 7), in ♀ 6 and 7 stalked.

Only the one species is known.

17. *Pol. hypogrammata*, Gn.

(*Polyclysta hypogrammata*, Gn. X, 376, pl. xxii, 4.)

♂♀. 31-34 mm. Head, palpi, and thorax dull olive-greenish mixed with fuscous and whitish-ochreous; palpi 2, terminal joint moderately long. Forewings somewhat elongate-triangular, hindmargin bowed, oblique; dull olive-greenish, with numerous waved dark fuscous transverse lines, partially interlined with pale whitish-ochreous; a basal patch suffused with darker posteriorly, its edge running from $\frac{1}{5}$ of costa to $\frac{1}{3}$ of inner margin, sinuate; median band formed of two suffusedly darker bands of three lines each, separated by a clear space, anterior edge from $\frac{2}{5}$ of costa to middle of inner margin, posterior edge from before $\frac{3}{4}$ of costa to $\frac{3}{4}$ of inner margin, slightly projecting in middle, with a marked sinuation above it; a small dark fuscous transverse discal mark in included space; an oblique cloudy dark fuscous streak from apex, interrupted by pale subterminal line; a blackish hindmarginal line, broken up into numerous small subquadrate spots: cilia pale greenish-ochreous. Hindwings in ♂ rather small, in ♀ normal, hindmargin rounded; fuscous, in ♂ suffused with ochreous-whitish on hindmargin and more broadly towards apex, in ♀ becoming darker fuscous posteriorly; cilia in ♂ whitish, in ♀ pale ochreous.

Sydney, New South Wales; in February and October, four specimens. This and the preceding and following species are superficially much alike; apart from structural characters, they may be distinguished easily by the shape of the basal patch.

10. *PROTAULACA*, n.g.

Face with somewhat projecting scales. Antennae in ♂ shortly ciliated. Palpi moderate, porrected, loosely scaled. Posterior tibiae with all spurs present. Forewings in ♂ beneath with slight groove along vein 1, clothed with rather rough hairs, areole double. Hindwings in ♂ with an irregular longitudinal groove above vein 1; veins 3 and 4 from a point or stalked, 6 and 7 stalked.

Nearly related to the two preceding genera.

18. *Prot. scythropa*, n.sp.

♂. 27-30 mm. Head and thorax rather dark fuscous, mixed with light greenish. Palpi dark fuscous, almost 2, terminal joint moderate. Antennae fuscous, ciliations $\frac{1}{2}$. Abdomen whitish-ochreous, densely irrorated with reddish-fuscous and sprinkled with dark fuscous. Legs dark fuscous, banded with whitish-ochreous. Forewings rather elongate-triangular, hindmargin bowed, somewhat oblique; whitish-ochreous, irregularly suffused with dull greenish, and irrorated with reddish-fuscous and dark fuscous; numerous cloudy irregular dark fuscous transverse lines; a very small somewhat darker basal patch, outer edge curved; median band formed by two narrow darker bands enclosing a lighter interspace, anterior edge running from $\frac{2}{3}$ of costa to beyond middle of inner margin, sinuate, posterior edge running from before $\frac{3}{4}$ of costa to $\frac{3}{4}$ of inner margin, slightly projecting in middle, sinuate inwards above middle and on lower half; a small dark fuscous transverse discal mark in median interspace; a double pale line following median band, margined by a darker fuscous line; an indistinct oblique dark fuscous streak from apex, interrupted by an ochreous whitish subterminal line; a hind-marginal series of small cloudy subquadrate dark fuscous spots arranged in pairs: cilia fuscous-whitish, base mixed with fuscous. Hindwings with hindmargin rounded; rather dark ochreous-brown, darker towards hindmargin; cilia fuscous-whitish.

Brisbane, Queensland; Sydney, New South Wales; in October, three specimens.

11. EUCHOECA, Hb.

Face quite smooth. Antennæ in ♂ ciliated. Palpi short, very slender, porrected, loosely scaled. Posterior tibiæ with all spurs present. Forewings with areole simple. Hindwings with veins 6 and 7 stalked.

This genus (to which I have restored an old name of Hübner) contains only a few European and North American species, and the one here given. It is a development of *Asthenæ*, which it closely resembles.

19. *Euch. rubropunctaria*, Dbld.

(*Ptychopoda rubropunctaria*, Dbld., Dieff. N.Z. ii, 287; *Acidalia pulchraria*, Walk. 780 (nec Dbld.), Butl. Cat. N.Z.L. pl. iii, 18; *Asthenæ risata*, Gn. IX, 438; *A. mullata*, id. Ent. Mo. Mag. V, 42; *A. rubropunctaria*, Meyr., Trans. N.Z.I. 1883, 60.)

♂♀. 19-22mm. Head and thorax pale rosy-ochreous, face dull reddish-fuscous, frontal fillet whitish. Forewings triangular, hindmargin bowed, waved; whitish-ochreous, more or less rosy-tinged, with about twelve slightly curved waved rosy or rosy-fuscous transverse lines, leaving a clear space between sixth and seventh on costal half; first, sixth, and eighth dotted with dark fuscous on veins; usually a larger black dot on sixth above middle; lower half of sixth to eighth sometimes blackish, with interspaces grey, or in disc beneath middle rarely grey-whitish; usually a small red spot on ninth in middle; a hind-marginal row of blackish dots: cilia ochreous-whitish, with two rosy lines. Hindwings with hindmargin rounded, waved, somewhat projecting or slightly angulated in middle; colour, lines, and dots as in forewings.

Duaringa, Queensland; Newcastle and Sydney, New South Wales; Fernshaw, Victoria; Mount Wellington and Georges Bay, Tasmania; from August to March, common. Occurs also throughout New Zealand. The larva feeds on *Haloragis*. The species is variable, but cannot be mistaken.

12. *ASTHENA*, Hb.

Face quite smooth. Antennæ in ♂ ciliated. Palpi short, very slender, porrected, loosely scaled. Posterior tibiae with all spurs present. Forewings with areole double. Hindwings with veins 6 and 7 stalked.

Besides those species given here, there are one or two in Europe, and one apparently peculiar to New Zealand.

- | | |
|---|-------------------------|
| 1. Wings greenish..... | 2. |
| Wings not greenish | 6. |
| 2. Face ferruginous-orange..... | 3. |
| Face fuscous or ochreous-brown..... | 4. |
| 3. Hindwings with hindmargin angulated..... | 20. <i>urarcha</i> . |
| Hindwings with hindmargin evenly rounded... | 26. <i>oceanias</i> . |
| 4. Forewings with basal third of cilia grey..... | 25. <i>euphylla</i> . |
| Forewings with basal third of cilia not grey... | 5. |
| 5. Head green on crown..... | 21. <i>thalassias</i> . |
| Head fuscous on crown (or rarely white)..... | 22. <i>pulchraria</i> . |
| 6. Groundcolour of wings yellowish-orange..... | 27. <i>anthodes</i> . |
| Groundcolour of wings not orange | 7. |
| 7. Hindwings with hindmargin evenly rounded... | 23. <i>xylocyma</i> . |
| Hindwings with hindmargin somewhat bent,
sinuate inwards beneath | 24. <i>scoliota</i> . |

20. *Asth. urarcha*, n.sp.

♂. 26 mm. Head greenish-yellowish, face ferruginous-orange, antennal fillet white, margined with ferruginous posteriorly. Palpi whitish. Antennæ white, ciliations $\frac{1}{4}$. Thorax very pale yellowish-green. Abdomen white, base pale greenish, apex with a spot of whitish-ferruginous. Legs fuscous, posterior pair white. Forewings triangular, hindmargin bowed, oblique; pale green, with numerous faint waved green-whitish lines; costal edge pale yellowish-ochreous, a dark green discal dot: cilia silvery-whitish, basal half pale yellowish. Hindwings with hindmargin almost

rectangularly angulated in middle, forming a strong rounded-triangular projection ; colour, lines, and cilia as in forewings.

Deloraine, Tasmania ; one specimen in November.

21. *Asth. thalassias*, n.sp.

♂♀. 22-24 mm. Head light green, face ochreous-brown, antennal fillet white. Palpi whitish, above fuscous. Antennæ white, beneath ochreous-yellowish, ciliations in ♂ $\frac{1}{4}$. Thorax light green. Abdomen light green, sprinkled with white, in ♂ with a pale ferruginous spot on claspers. Anterior legs ochreous-yellowish, tibiae and tarsi fuscous-tinged, middle and posterior legs white. Forewings triangular, hindmargin bowed, oblique ; light bluish-green, with numerous faint waved blue-whitish transverse lines ; costal edge yellow-ochreous ; a dark green discal dot ; three lines of ground colour beyond middle appear to form a separate band : cilia green-whitish. Hindwings with hindmargin rounded, waved, somewhat bent in middle ; colour, lines, and cilia as in forewings.

Rockhampton, Queensland ; Sydney, New South Wales ; in October and November, five specimens. This species, which is sometimes confused with *pulchraria*, is proved to be distinct by the shorter antennal ciliations of the ♂. It is always without the fuscous suffusion of the crown of the head and costa of forewings, is distinctly brighter-coloured, and the cilia are perceptibly greenish-tinged.

22. *Asth. pulchraria*, Dbld.

(*Acidalia pulchraria*, Dbld., Dieff. N.Z. ii, 286 ; *Asthena ordinata*, Gn. IX, 438, pl. xix, 4, Butl. Cat. N.Z.L. pl. iii, 20, Feld. pl. cxxviii, 17 ; *Chlorochroma plurilineata*, Walk. 563 ; *Asthena pulchraria*, Meyr., Trans. N.Z. Inst. 1883, 69.)

♂♀. 21-26 mm. Head fuscous (or rarely white ?), face dark ochreous-fuscous, antennal fillet white. Palpi whitish, above dark fuscous. Antennæ whitish, spotted with fuscous, ciliations in ♂ $\frac{1}{2}$. Thorax pale green, anterior margin suffused with fuscous (or rarely white ?). Abdomen whitish, towards base pale greenish. Anterior

legs dark fuscous, middle legs fuscous, posterior legs white. Forewings triangular, hindmargin nearly straight or slightly bowed; light bluish-green, with numerous indistinct waved green-whitish transverse lines; a fuscous costal streak from base to apex (rarely absent?), costal edge more yellowish-tinged; a dark green discal dot: cilia white. Hindwings with hindmargin rounded, somewhat bent in middle; colour, lines, and cilia as in forewings; sometimes a dark green discal dot.

Glen Innes (3500 feet), Bathurst (2500 feet), Sydney, Blackheath (3500 feet), and Mount Kosciusko (4000 feet), New South Wales; Hobart and Deloraine, Tasmania; Albany, West Australia; from August to February, common. Occurs also throughout New Zealand. My material has not enabled me to satisfy myself whether the female specimens with more rounded wings, and without fuscous colouring of head and costa of forewings (provisionally included above) are really referable to this species or distinct; I have seen three, two being from New Zealand, the third from New South Wales.

23. *Asth. xylocyma*, n.sp.

♂♀. 21-23 mm. Head, thorax, and abdomen whitish-fuscous; face rather dark ochreous-brown; abdomen with an obscure double row of dark fuscous dots on back, in ♂ with blackish exsertible genital tuft. Palpi fuscous whitish, above dark fuscous. Antennae whitish, obscurely dotted with fuscous, ciliations in ♂ $\frac{1}{2}$. Legs ochreous-whitish, anterior pair fuscous. Forewings triangular, hindmargin bowed, oblique, pale greyish-ochreous, with numerous indistinct curved waved fuscous lines, partially marked with darker fuscous dots on veins; a blackish discal dot; sometimes a small quadrate spot outlined with dark fuscous on inner margin beyond middle; a hindmarginal series of dark fuscous marks arranged in pairs: cilia pale whitish-fuscous. Hindwings with hindmargin rounded, in ♂ with anal angle fringed with dense recurved hairs; colour and markings as in forewings, but without dorsal spot.

Albany, West Australia; in September and October, four specimens. In the British Museum are two specimens, certainly of this species, which are said to be from New Zealand. The peculiar hairy anal angle of hindwings in ♂ separates it from all others known.

24. *Asth. scoliota*, n.sp.

♀. 21-22 mm. Head fuscous-whitish, face fuscous, antennal fillet white. Palpi white. Antennæ whitish. Thorax fuscous-whitish, with two dark fuscous posterior dots. Abdomen ochreous-whitish, with a double dorsal series of dark fuscous dots, sometimes partially obsolete. Legs fuscous, posterior pair whitish. Forewings triangular, hindmargin bowed, oblique; fuscous-whitish or pale whitish-ochreous; about seven somewhat curved lines more or less completely indicated by blackish dots or dashes on veins; fourth and sixth more strongly marked, forming edges of median band, anterior somewhat angulated near costa, posterior forming a very slight double projection in middle, both sometimes strongly black on inner margin and connected there by an elongate grey spot; a blackish discal dot; a hindmarginal series of obscure blackish dots arranged in pairs: cilia ochreous-whitish. Hindwings with hindmargin rounded and waved on upper half, somewhat bent in middle, slightly sinuate inwards on lower half; fuscous-whitish, with a few dark fuscous scales faintly indicating lines; median line sometimes marked with black in middle and on inner margin; hindmarginal dots and cilia as in forewings.

Albany, West Australia; in September and October, three specimens. Recognisable by the peculiar form of the hindwings.

25. *Asth. euphylla*, n.sp.

♂. 21-24 mm. Head and thorax dull light green, face rather dark fuscous, antennal fillet white. Palpi whitish-fuscous. Antennæ fuscous-whitish, ciliations $\frac{1}{2}$. Abdomen ochreous-whitish, towards base pale greenish above. Legs fuscous, posterior pair fuscous-whitish. Forewings triangular, hindmargin bowed, oblique; dull green, with numerous faint waved green-whitish transverse

lines except on median band; costal edge light yellowish-ochreous; a dark green discal dot; anterior edge of median band very indistinct, from about $\frac{2}{3}$ of costa to middle of inner margin, curved; posterior edge well-marked by a more distinct whitish line, from before $\frac{1}{4}$ of costa to before $\frac{1}{4}$ of inner margin, gently curved towards costa, nearly straight beneath: cilia silvery-white, basal third grey. Hindwings with hindmargin strongly rounded, slightly bent in middle; pale green, with faint curved waved whitish lines, more distinct on posterior half; a more distinct whitish median line, somewhat bent in middle; cilia silvery-whitish, base greyish.

Delorsaine and Hobart, Tasmania; in December, four specimens.

26. *Asth. oceanias*, n.sp.

♀. 27 mm. Head and thorax pale green, face ferruginous-orange, antennal fillet white. Palpi white. Antennæ white, beneath yellowish. Abdomen green-whitish. Legs white, anterior femora ochreous-yellow, tibiae and tarsi ochreous-tinged. Forewings triangular, hindmargin gently rounded, rather oblique; pale blue-green, with numerous very faint waved paler lines; costa slenderly yellowish-white: cilia whitish yellowish, terminal half more whitish. Hindwings with hindmargin rounded; colour, lines, and cilia as in forewings, but lines more whitish.

Albany, West Australia; in September, one specimen taken after dark at rest on a leaf.

27. *Asth. anthodes*, n.sp.

♂. 20 mm. Head deep orange-yellow, face rather dark purplish-fuscous. Palpi ochreous-yellowish. Antennæ yellow-whitish, ciliations $\frac{1}{2}$. Thorax orange, mixed with dark purplish. Abdomen yellow-whitish, mixed with yellow and purplish towards base. Legs yellow-whitish, anterior pair mixed with purplish-fuscous. Forewings triangular, hindmargin slightly bowed, oblique; yellowish-orange, with numerous cloudy waved dull purple transverse lines, the partial confluence of these forms a median band, very

narrow on lower third, dilated above to enclose a clear space, containing a dark fuscous discal dot : cilia yellow-whitish (imperfect). Hindwings with hindmargin rounded ; colour, lines, and cilia as in forewings, but median band hardly indicated.

Sydney, New South Wales ; Mount Lofty, South Australia ; in November, two specimens.

13. SCORDYLIA, Gn.

Face with slight cone of scales. Antennæ in ♂ ciliated. Palpi moderately long, porrected, rough-scaled. Posterior tibiæ with all spurs present. Forewings with areole simple. Hindwings with veins 6 and 7 stalked.

This genus appears specially characteristic of South America, where it is rather numerously represented ; I am acquainted besides only with one or two Indo-Malayan species, and with the small locally-developed group of Australian species, probably derived from the Indo-Malayan source.

- | | |
|--|---------------------------|
| 1. Forewings ochreous..... | 29. <i>leucophragma</i> . |
| Forewings fuscous..... | 2. |
| 2. Median band of forewings with very long sharp posterior projection..... | 28. <i>oxyntis</i> . |
| Median band of forewings without long projection..... | 3. |
| 3. Median band of forewings margined anteriorly with ferruginous..... | 30. <i>decipiens</i> . |
| Median band of forewings not margined with ferruginous..... | 31. <i>tristis</i> . |

28. *Scord. oxyntis*, n.sp.

♂♀. 25 mm. Head, palpi, antennæ, thorax, abdomen, and legs fuscous ; antennal ciliations in ♂ $\frac{1}{4}$. Forewings rather elongate-triangular, costa moderately arched, hindmargin gently rounded, oblique, inner margin rounded ; rather light fuscous ; a fine ochreous-whitish line from $\frac{1}{5}$ of costa to $\frac{1}{5}$ of inner margin, forming

two very acute projecting angles outwards, anteriorly suffusedly margined and angles filled with dark fuscous; a sharply marked dark fuscous median band, margined with fine ochreous-whitish lines, from about middle of costa to middle of inner margin, very narrow except above middle, where it forms a long strong very acute projection outwards; an oblique rather irregular dark fuscous streak from apex to near median band, suffusedly dilated beneath, and margined above towards its middle by a white longitudinal dash; a slight ochreous suffusion beneath this, and on veins posteriorly; anterior margin of subterminal line indicated towards costa by a somewhat darker shade: cilia fuscous, terminal half whitish-fuscous obscurely barred with darker. Hindwings with hindmargin rounded; pale fuscous; cilia pale fuscous.

Melbourne, Victoria; two specimens.

29. *Scord. leucophragma*, n.sp.

♂♀. 25-26 mm. Head, palpi, antennæ, thorax, abdomen, and legs pale ochreous. Forewings elongate-triangular, costa moderately arched, hindmargin faintly sinuate, oblique; rather light ochreous, with three well-marked white lines; first from $\frac{1}{4}$ of costa to $\frac{1}{4}$ of inner margin, sinuate, anteriorly dark-margined; second from middle of costa to middle of inner margin, sinuate, posteriorly dark-margined, third from $\frac{2}{3}$ of costa to $\frac{1}{4}$ of inner margin, anteriorly dark-margined, middle third forming a moderate triangular projection outwards; a white longitudinal dash towards hindmargin beneath apex, beneath and posteriorly dark margined: cilia light ochreous, obscurely barred with darker (imperfect). Hindwings with hindmargin rounded, pale whitish-ochreous, more ochreous towards hindmargin; cilia pale whitish-ochreous.

Melbourne, Victoria; two specimens received from Dr. Lucas, who has taken it commonly.

30. *Scord. decipiens*, Butl.

(*Cidaria decipiens*, Butl., Trans. Ent. Soc. Lond. 1886, 438.)

♂. 24 mm. Head, palpi, antennæ, thorax, abdomen, and legs fuscous mixed with dark fuscous. Forewings triangular, hind-

margin bowed, oblique; fuscous, irrorated with blackish; a blackish-fuscous basal patch, its outer edge angulated in middle; a blackish-fuscous median band, including a lighter space on costal half, anterior edge running from $\frac{2}{3}$ of costa to middle of inner margin, concave, waved, finely margined with white and then more broadly with ferruginous, posterior edge running from $\frac{3}{4}$ of costa to $\frac{3}{4}$ of inner margin, convex, subdentate, finely margined with white; an obscure whitish subterminal line, preceded by an indistinct ochreous shade, and interrupted by a small blackish-fuscous spot above middle. Hindwings grey, with a faint angulated whitish line beyond middle.

Sydney, New South Wales; in August, two specimens.

31. *Scord. tristis*, Butl.

(*Phytometra tristis*, Butl., Ann. Mag. Nat. Hist. 1882, 90.)

♂. 22 mm. Head, palpi, thorax, abdomen, and legs fuscous; palpi with rough projecting hairs. Antennæ fuscous, obscurely ringed with whitish. Forewings somewhat elongate-triangular, hindmargin bowed, oblique; fuscous; a faint paler line near base; a broad dark fuscous median band, obscurely margined with whitish, more distinctly towards costa, anterior edge running from $\frac{2}{3}$ of costa to before middle of inner margin, slightly concave, posterior edge from beyond $\frac{2}{3}$ of costa to $\frac{4}{5}$ of inner margin, somewhat projecting broadly in middle, and sinuate inwards above middle; a short whitish mark on costa near apex: cilia pale fuscous; tips mixed with whitish. Hindwings fuscous-grey; cilia whitish-fuscous.

Melbourne, Victoria; two specimens.

14. HYDRIOMENA, Hb.

Face with a short cone or loosely projecting scales. Antennæ in ♂ ciliated. Palpi moderate, porrected, rough-scaled. Posterior tibiæ with all spurs present. Forewings with areole double. Hindwings with veins 6 and 7 stalked.

A very large and universally distributed genus ; I have formerly called it *Cidaria*, Tr., but here adopt the older name of Hübner. It exhibits great uniformity in structure ; vein 6 of the forewings sometimes rises out of 9, sometimes separate, but I find the character not constant within the limits of the same species. Curious abnormalities will be found noted under *H. phaedra* and *H. lamprotis*.

- | | |
|--|---------------------------|
| 1. Hindwings, at least in part, clear yellow or orange..... | 2. |
| Hindwings not yellow..... | 20. |
| 2. Hindwings with sharply-marked blackish hindmarginal band throughout..... | 3. |
| Hindwings with band suffused, incomplete, or absent..... | 7. |
| 3. Face and costa of forewings crimson..... | 56. <i>perornata</i> . |
| Face and costa of forewings not crimson... | 4. |
| 4. Forewings with a yellow or whitish line about $\frac{1}{2}$ | 5. |
| Forewings with at most a costal dot at $\frac{1}{5}$ | 53. <i>oxygona</i> . |
| 5. Markings of forewings ochreous-white..... | 52. <i>polycarpa</i> . |
| Markings of forewings yellow or orange... | 6. |
| 6. Forewings with subterminal line forming about four distinct spots | 55. <i>chrysocyma</i> . |
| Forewings with subterminal line reduced to a short costal streak..... | 54. <i>stereozona</i> . |
| 7. Forewings with posterior margin of median band straight..... | 36. <i>conifasciata</i> . |
| Forewings with posterior margin of median band curved or angulated.. | 8. |
| 8. Hindwings with suffused or incomplete dark fuscous hindmarginal band..... | 9. |
| Hindwings without dark fuscous band..... | 13. |

9. Median band of forewings followed by two
confluent white lines..... 45. *aglaodes*.
Median band of forewings not followed by
two white lines..... 10.
10. Forewings with variable white markings
in median band..... 47. *heteroleuca*.
Forewings without white markings in band 11.
11. Posterior margin of median band with
upper $\frac{2}{3}$ strongly curved..... 57. *mecynata*.
Posterior margin of median band not
strongly curved..... 12.
12. Median band with distinct projection;
antennal ciliations 1 48. *doliopsis*.
Median band without distinct projection;
antennal ciliations $\frac{1}{2}$ 49. *languescens*.
13. Forewings with median band wholly
suffused with dark fuscous..... 35. *lucidulata*.
Forewings with median band not wholly
dark fuscous..... 14.
14. Forewings with central fascia of median
band darker than margins..... 60. *polyxantha*.
Forewings with central fascia of median
band not darker than margins..... 15.
15. Forewings with basal $\frac{2}{3}$ forming a distinct
darker patch..... 32. *phaedra*.
Forewings with basal $\frac{2}{3}$ not darker..... 16.
16. Forewings with narrow central snow-white
fascia..... 59. *leucozona*.
Forewings without white fascia..... 17.
17. Forewings with terminal half of cilia white
(sometimes barred)..... 62. *ebuleata*.
Forewings with terminal half of cilia not
white..... 18.

18. Median band of forewings with triangular subacute projection..... 61. *correlata*.
 Median band of forewings without acute projection..... 19.
19. Posterior edge of median band formed by a fuscous fascia..... 64. *subochraria*.
 Posterior edge of median band not fuscous 58. *innulata*.
20. Hindmargin of forewings subconcave..... 38. *anthracinata*.
 Hindmargin of forewings not subconcave 21.
21. Hindwings suffused with whitish towards costa..... 22.
 Hindwings not suffused with whitish towards costa..... 23.
22. Anterior margin of median band to inner margin at $\frac{2}{3}$ 50. *orthropis*.
 Anterior margin of median band to inner margin before $\frac{1}{4}$ 71. *leucophanes*
23. Hindwings distinctly tinged with orange or fulvous..... 24.
 Hindwings not distinctly tinged with orange or fulvous 26.
24. Median band of forewings with strong acute projection... .. 42. *lamprotis*.
 Median band of forewings with short obtuse projection..... 25.
25. Forewings with pale central fascia, preceded by dark fascia..... 43. *constipata*.
 Forewings without such fasciæ 41. *cataphaea*.
26. Forewings with distinct white spot beyond median band in middle..... 70. *brujata*.
 Forewings without white spot beyond median band 27.

27. Forewings with posterior margin of median band almost straight..... 37. *subrectaria*.
 Forewings with posterior margin of median band not straight..... 28.
28. Median band with strong acute projection 29.
 Median band with slight or obtuse projection..... 31.
29. Median band with anterior margin angulated near costa..... 67. *cryeropa*.
 Median band with anterior margin not angulated near costa..... 30.
30. Outer margin of basal patch evenly curved 34. *rhynchota*.
 Outer margin of basal patch oblique, straight, angulated beneath.. 33. *interruptata*.
31. Forewings with terminal half of cilia wholly whitish, sometimes tinged with ochreous or rosy..... 32.
 Forewings with terminal half of cilia not wholly whitish..... 33.
32. Posterior margin of median band with upper $\frac{2}{3}$ strongly curved..... 57. *mecynata*, var.
 Posterior margin of median band not strongly curved..... 63. *uncinata*.
33. Hindwings posteriorly purplish-tinged..... 65. *trygodes*.
 Hindwings posteriorly not purplish-tinged 34.
34. Abdomen with narrow white basal band... 69. *severata*.
 Abdomen without white band..... 35.
35. Postmedian white lines interrupted by teeth of central projection..... 46. *imperviata*.
 Postmedian lines not interrupted..... 36.
36. Forewings with subterminal line distinctly whitish..... 37.
 Forewings with subterminal line not whitish..... 39.

37. Hindwings distinctly ochreous..... 44. *synchora*.
 Hindwings not ochreous..... 38.
38. Hindwings with numerous obscure darker
 lines..... 39. *strumosa*.
 Hindwings without darker lines..... 40. *symphona*.
39. Forewings with ground colour whitish-
 ochreous..... 51. *microcyma*.
 Forewings with ground colour fuscous or
 grey..... 40.
40. Upper half of posterior margin of median
 band less oblique than hindmargin of
 wing; palpi in ♀ $1\frac{1}{2}$ 66. *decreta*.
 Upper half of posterior margin of median
 band parallel to hindmargin of wing;
 palpi in ♀ $2\frac{1}{4}$ 68. *mortuata*.

32. *Hydr. phaedra*, n.sp.

♂♀. 20-22 mm. Head, palpi, thorax, and abdomen whitish-ochreous irrorated with fuscous; palpi in ♂ 2, in ♀ $2\frac{1}{4}$. Antennæ whitish-fuscous, in ♂ filiform, ciliations $\frac{1}{4}$. Legs dark fuscous, apex of joints whitish-ochreous. Forewings triangular, hindmargin slightly waved, bowed, rather oblique; light brownish-ochreous, with very indistinctly marked irregular blackish transverse lines; basal area more brownish-tinged, lines more strongly marked; anterior edge of median band formed by a slightly curved dark fuscous fascia from $\frac{2}{5}$ of costa to $\frac{2}{3}$ of inner margin, posterior edge by a curved fascia of groundcolour marked with three fine blackish lines, outer strongly marked and posteriorly white-margined on costal half, projecting somewhat below costa, and forming a moderately strong bidentate projection in middle, included median space clear pale ochreous or white, sometimes with a minute dark fuscous discal dot; subterminal line white, obsolete towards anal angle, interrupted above middle by a dark fuscous suffusion extended

obliquely to hindmargin beneath apex ; a black somewhat interrupted hindmarginal line : cilia light brownish-ochreous, obscurely barred with darker on basal half, and mixed with whitish on terminal half, with a white bar at apex. Hindwings with hindmargin rounded, strongly waved ; deep ochreous-yellow, towards anal angle marked with two or three short dark fuscous lines from inner margin ; a dark fuscous hindmarginal line ; cilia light ochreous-yellow, mixed with fuscous towards anal angle.

Sydney and Bulli, New South Wales ; in October, five specimens. A distinct and very elegant species. One of my specimens has (in one forewing only) a neuration which at first sight seems quite abnormal, vein 7 rising from a point with 6 but quite separate from 8 and 9, whilst 9, 10, and 11 appear to rise from 8, and this last springs from much before the angle of the cell ; the other forewing being perfectly normal. There can be no doubt here that the origin of the veins is really exactly as usual, but that certain portions of them have become obsolete by non-development, viz., that portion of 9 which lies between the origin of 7 and the anastomosis with 10, and also that portion of 10 which lies between its origin and its anastomosis with 11. Although in the case of this species it is certainly a morbid development or monstrosity, it is of particular interest, because a similar structure is found normally in two other genera of the family (*Acodia* and the European genus *Mesotype*), and we can see here how it originated. It is particularly necessary to rightly conceive of this change, because the rising of 7 and 8 of the forewings out of 9 is an essential characteristic of the whole group of the *Geometrina*, and it is extremely important to show that these genera are only apparently and not really exceptional.

33. *Hydr. interruptata*, Gn.

(*Cidaria interruptata*, Gn. X, 469, pl. ix, 6.)

♂♀. 23-27 mm. Head, palpi, and thorax pale brownish, mixed with whitish and dark fuscous ; palpi 2. Antennæ fuscous, in ♂ serrulate, ciliations $\frac{3}{4}$. Abdomen whitish-fuscous. Legs dark

fuscous irrorated with whitish. Forewings triangular, hindmargin bowed, waved, rather oblique; fuscous, mixed with dark fuscous, and often partially mixed or suffused with deep ochreous; basal area marked with faint fine whitish transverse lines; a conspicuous straight white line from costa near base to $\frac{1}{4}$ of inner margin, sharply angulated near lower extremity; median band marked with obscure whitish lines in middle towards costa, suffused with darker towards both margins and limited by broad white lines, anterior from about $\frac{1}{2}$ of costa to before middle of inner margin, nearly rectangularly angulated below middle, posterior from about $\frac{2}{3}$ of costa to before $\frac{3}{4}$ of inner margin, central third forming a strong acute projection; these two lines tend to be indented on median fold and sometimes to coalesce in such a way that the median band is strongly interrupted there, the lines being also interrupted and margining segments of band; a black median discal dot, two pale lines immediately following posterior margin of band; a hardly waved narrow white subterminal line; an oblique white streak from apex, extending to margin of median band but suffused with pale ochreous towards lower extremity; an interrupted blackish hindmarginal line, preceded with whitish on a spot below middle: cilia white, with a fuscous median line, and barred with fuscous. Hindwings with hindmargin rounded, waved; pale brownish grey, darker posteriorly, partially ochreous tinged, especially on veins posteriorly; numerous faint pale transverse lines; a median line, acutely angulated in middle, and a subterminal line somewhat more whitish, preceded by darker shades; hindmarginal line and cilia as in forewings.

Bathurst, New South Wales, also from Tasmania; five specimens received from Mrs. Stephenson and Mr. G. Barnard.

34. *Hydr. rhynchota*, n.sp.

♂♀. 26-30 mm. Head, palpi, and thorax light brownish, mixed with whitish and dark fuscous, thorax with two dark fuscous transverse bars; palpi $1\frac{2}{3}$. Antennæ brownish, in ♂ subdentate, ciliations $\frac{1}{2}$. Abdomen pale whitish-ochreous, sprinkled with

fuscous. Legs whitish-ochreous, irrorated with dark fuscous. Forewings triangular, hindmargin waved, bowed, rather oblique; light fuscous, partially mixed with dull ochreous, and sprinkled with pale crimson and white scales; numerous more or less indistinct irregular transverse blackish lines, towards base alternating with obscure whitish lines; an outwards-curved more distinct white line from $\frac{1}{5}$ of costa to $\frac{1}{5}$ of inner margin, anteriorly strongly blackish-margined; median band enclosing a small white suffusion towards costa in middle, marked with a black discal dot, both margins of band blackish, limited by strong white fasciæ bisected by fuscous lines, anterior edge from $\frac{2}{5}$ of costa to middle of inner margin, slightly curved, in ♀ indented on fold, posterior from before $\frac{3}{4}$ of costa to about $\frac{3}{4}$ of inner margin, with a strong acute triangular projection above middle, beneath this concave, so that in ♀ median band is almost interrupted on fold; a narrow waved whitish subterminal line, preceded by a blackish suffusion above middle and on lower half; an obscure light ochreous oblique streak from apex, containing some white scales at apex; a blackish hindmarginal line: cilia light grey, sprinkled with whitish. Hindwings with hindmargin rounded, waved; pale whitish-ochreous, hindmargin somewhat darker; faint traces of several curved and bent transverse grey lines, darker on inner margin; hindmarginal line and cilia as in forewings.

Mount Kosciusko (4700 feet), New South Wales, in January; two specimens.

35. *Hydr. lucidulata*, Walk.

(*Cidaria lucidulata*, Walk. 1407.)

♂♀. 26-29 mm. Head, palpi, and thorax fuscous mixed with whitish; palpi $2\frac{1}{2}$. Antennæ fuscous, in ♂ filiform, ciliations $\frac{1}{2}$. Abdomen fuscous on back, with a double row of dark fuscous spots, sides and apex suffused with pale whitish-ochreous. Legs dark fuscous, irrorated with whitish-ochreous. Forewings triangular, hindmargin waved, bowed, rather oblique; fuscous, mixed and sometimes suffused with reddish-ochreous, and sprinkled with blackish-fuscous; basal area suffused with dark fuscous, limited

by a very fine curved whitish line, bent above middle; space between this and median band more reddish-ochreous, becoming blackish on inner margin; median band wholly suffused with dark fuscous, edges more blackish, limited anteriorly by a fine double whitish line from $\frac{1}{3}$ of costa to $\frac{3}{4}$ of inner margin, twice or thrice indented, posteriorly by a moderate white line from $\frac{2}{3}$ of costa to $\frac{3}{4}$ of inner margin, slightly sinuate, forming a short rounded-triangular projection above middle; immediately beyond this is a parallel band of two or three cloudy whitish lines; subterminal waved, whitish, indistinct, whiter and dentate towards costa, preceded by a blackish shade except in middle; a short pale ochreous oblique streak from apex, above which is a whitish suffusion, below it a blackish suffusion more or less extended along hindmargin; a black hindmarginal line interrupted by pale ochreous dots: cilia fuscous sprinkled with whitish, with faint darker bars and median line. Hindwings with hindmargin rounded, waved; deep ochreous-yellow or orange-yellow; inner-marginal third marked with numerous faint transverse fuscous lines, sometimes almost wholly obsolete; usually a short dark fuscous mark from near anal angle, and a narrow dark fuscous suffusion on lower part of hindmargin; a dark fuscous hind-marginal line; cilia yellow-whitish, more ochreous-yellowish towards base, with a cloudy dark grey median line becoming obsolete towards apex.

Mount Kosciusko (4300 feet) and Blackheath (3500 feet), New South Wales; Melbourne, Victoria; Deloraine, Tasmania; from December to February, six specimens.

36. *Hydr. conifasciata*, Butl.

(*Chrysolarentia conifasciata*, Butl., Ann. Mag. N. H. 1882, 93.)

♂. 31 mm. Head, palpi, and thorax ochreous-brown, sprinkled with whitish-ochreous; palpi 2. Antennæ fuscous, filiform, ciliations 4. Forewings triangular, hindmargin bowed, slightly waved, rather oblique; ochreous brown; basal area with obscure dark fuscous lines, limited by a distinct whitish line, obtusely bent

near costa ; space between this and median band blackish-fuscous towards inner margin ; median band suffused with dark fuscous except sometimes on a pale space towards costa in middle, broad on costa and diminishing gradually almost to a point on inner margin beyond middle, anterior edge limited by a nearly straight band of two whitish lines, posterior edge by a straight band of three or four whitish lines suffused together ; subterminal whitish, reduced to a short dentate streak from costa, a small spot in middle, and a short streak from anal angle ; a straight oblique whitish streak from apex, beneath which the hindmarginal area is suffused with dark fuscous : cilia fuscous, sprinkled with whitish, and obscurely barred with darker. Hindwings with hindmargin rounded, waved ; orange-yellow ; a short transverse dark fuscous streak from inner margin above anal angle ; a narrow rather dark fuscous hindmarginal band from beneath apex to anal angle ; cilia whitish-fuscous.

Blackheath (3500 feet), New South Wales ; Hobart, Tasmania ; also from Victoria ; in February three specimens received from Messrs. Raynor and Barnard.

37. *Hydr. subrectaria*, Gn.

(*Coremia subrectaria*, Gn. X, 411 ; *Cidaria responsata*, Walk. 1409 ; *Melanthia casta*, Butl., Cist. Ent. ii, 553.)

♂♀. 22-24 mm. Head, palpi, and thorax fuscous, mixed with dark fuscous and whitish ; palpi 2. Antennæ whitish-fuscous, in ♂ subdentate, ciliations $\frac{1}{2}$. Forewings triangular, hindmargin somewhat bowed, gently waved, rather oblique ; pale fuscous, irrorated with dark fuscous, forming obscure transverse lines ; a nearly straight whitish line about $\frac{1}{4}$, and one or two less distinct before it ; median band slightly darker, with a whitish suffusion towards costa in middle, containing a blackish discal dot, anterior edge limited by a double nearly straight whitish line from $\frac{1}{3}$ of costa to $\frac{2}{5}$ of inner margin, posterior edge by a stronger double white line, nearly straight or twice faintly sinuate, from $\frac{3}{4}$ of costa to $\frac{2}{3}$ of inner margin ; one or two of the included dark lines beyond

pale costal space of median band are strongly angulated near costa; subterminal slender, white, waved, entire; a short oblique white suffusion from apex; sharply marked above; a more or less interrupted blackish hindmarginal line: cilia pale fuscous, with a whitish line, and more or less indicated whitish and darker bars. Hindwings with hindmargin rounded, somewhat waved; pale whitish-fuscous, with numerous indistinct nearly straight somewhat darker and whitish lines, more distinct and somewhat curved towards hindmargin, subterminal waved; hindmarginal line and cilia as in forewings.

Bathurst (2700 feet) and Mount Kosciusko (2700 feet), New South Wales; Mount Lofty, South Australia; in November and January, locally common, in damp places.

38. *Hydr. anthracinata*, Gn.

(*Camptogramma anthracinata*, Gn. X, 425, pl. vii, 5, *Melanodes atriplena*, Walk. 324.)

♂♀. 29-33 mm. Head, palpi, and thorax blackish; palpi 1½. Antennae blackish, in ♂ subdentate, ciliations 1. Forewings triangular, hindmargin in ♂ rather strongly, in ♀ more slightly concave, so that apex seems to project; dark fuscous, with numerous more or less marked somewhat waved black transverse lines; margins of median band formed by narrow black fasciae, anterior from before middle of costa to before middle of inner margin, faintly curved, posterior from ¾ of costa to ¾ of inner margin, shortly curved outwards about middle and sinuate inwards above this; a transverse black discal dot; a small whitish mark before hindmargin in middle, indicating subterminal line: cilia dark fuscous, with a few whitish scales, tips paler. Hindwings with hindmargin strongly waved, rounded; rather dark fuscous grey, lighter towards costa, suffusedly marked with blackish lines towards anal angle; cilia dark grey, becoming whitish round apex.

Mount Macedon and Warragul, Victoria; Mount Wellington, Launceston, and Campbelltown, Tasmania; in December and January rather common, resting on the trunks of trees blackened by fire.

39. *Hydr. strumosata*, Gn.

(*Coremia strumosata*, Gn. X, 419 ; ? *C. excentrata*, ib. 419 ; ? *C. quartanata*, ib. 419 ; *C. solutata*, Walk. 1319 ; *Cidaria intentata*, ib. 1406 ; *C. solitata*, ib. 1409.)

♂♀. 30-33 mm. Head, palpi, and thorax rather dark fuscous mixed with whitish ; palpi $2\frac{1}{4}$. Antennæ dark grey, in ♂ subdentate, ciliations $\frac{2}{3}$. Forewings triangular, hindmargin slightly waved, nearly straight, rather oblique ; fuscous, somewhat mixed with ochreous, and irrorated with blackish, which forms numerous irregular waved transverse lines ; an obscure slightly curved whitish line about $\frac{1}{5}$; median band sometimes rather darker, somewhat marked with black on margins, forming wedge-shaped spots on veins, limited by waved whitish lines, anterior edge from before $\frac{2}{5}$ of costa to before middle of inner margin, slightly concave, indented below middle, posterior edge from $\frac{3}{4}$ of costa to $\frac{3}{4}$ of inner margin, somewhat curved outwards beneath costa, and forming a broad rather short flatly bidentate projection about middle ; a small transverse black median discal spot, surrounding space irrorated with whitish ; beyond posterior edge of band are one or two similar suffused whitish lines ; subterminal whitish, evenly waved, preceded by a darker shade ; a short slender oblique whitish streak from apex ; a black hindmarginal line : cilia fuscous, base and a median line sprinkled with whitish, with faint darker bars. Hindwings with hindmargin rounded, strongly waved ; pale fuscous, slightly ochreous-tinged ; numerous faint waved slightly curved fuscous lines, except on basal third, interspaces more or less sprinkled with whitish ; hindmarginal space beyond subterminal line irrorated with dark fuscous ; hindmarginal line and cilia as in forewings.

Duaringa, Queensland ; Bathurst and Mount Kosciusko (4000 feet), New South Wales ; Mount Macedon, Victoria ; Launceston, Deloraine, Georges Bay, and Hobart, Tasmania ; Mount Lofty, South Australia ; from December to March, common. As frequently in the genus, the median band is usually considerably broader in the ♀ than in the ♂, causing a different superficial appearance, but there is no essential difference in the markings.

40. *Hydr. symphona*, n.sp.

♂. 32-34 mm. Head, palpi, thorax, abdomen, and legs fuscous, irrorated with ochreous-whitish; palpi $1\frac{1}{2}$. Antennæ grey, serrulate, ciliations $\frac{2}{3}$. Forewings triangular, hindmargin faintly waved, rounded, oblique; rather light fuscous, thinly irrorated with pale whitish-ochreous, posteriorly more strongly; numerous obscure waved darker transverse lines; two faint cloudy whitish slightly curved lines towards base; median band more or less irrorated with whitish towards middle, especially round dark fuscous discal dot, limited by waved cloudy whitish lines, anterior from beyond $\frac{1}{3}$ of costa to beyond $\frac{1}{3}$ of inner margin, slightly concave, posterior from $\frac{2}{4}$ of costa to $\frac{2}{4}$ of inner margin, somewhat convex near costa, median third bent outwards to form a short broad unequally bidentate projection; a fainter whitish line close beyond posterior margin; subterminal cloudy, waved, whitish; a dark fuscous hindmarginal line: cilia pale fuscous, with faintly indicated whitish bars. Hindwings with hindmargin waved, rounded; pale whitish-fuscous; sometimes a darker discal dot; hindmarginal line and cilia as in forewings.

♀. Head, thorax, &c., irrorated with white; palpi $2\frac{1}{4}$. Forewings with apex somewhat produced; fuscous, irrorated or partly suffused with light yellowish-ochreous; basal area irrorated with white, bounded by a cloudy slightly curved whitish line; median band as in ♂, but median whitish irroration more defined and limited by two fine dark fuscous lines, discal dot much larger, transverse, blackish, marginal white lines broader, not or very slightly waved, edged internally with dark fuscous; subterminal broader than in ♂, suffusedly edged anteriorly with dark fuscous; hindmarginal line and cilia as in ♂, but cilia more distinctly barred. Hindwings with apex considerably more produced, projecting much beyond anal angle of forewings; very pale whitish-fuscous, towards hindmargin rather darker, with faint cloudy whitish subterminal line; sometimes a darker discal dot; hindmarginal line and cilia as in forewings.

Mount Kosciusko (5800 feet), New South Wales, in January;

41. *Hydr. cataphaea*, n.sp.

♂♀. 25-26 mm. Head and thorax dark fuscous, irrorated with pale ochreous. Palpi $2\frac{1}{2}$, dark fuscous mixed with whitish. Antennæ dark fuscous, in ♂ filiform, ciliations minute ($\frac{1}{6}$). Abdomen dark grey, mixed with orange-ochreous, and sometimes with whitish-ochreous. Legs dark grey, irrorated with whitish. Forewings somewhat elongate-triangular, hindmargin somewhat bowed, rather oblique; fuscous, densely and suffusedly irrorated with light ochreous or fulvous, with obscure waved darker fuscous transverse lines; sometimes a very faint whitish line about $\frac{1}{5}$, bent above middle; median band sometimes sprinkled with whitish towards costa in middle, sometimes marked with a transverse darker fuscous discal spot (usually obsolete), limited by waved dark fuscous lines succeeded by paler double lines, of which the inner is sometimes obscurely whitish, anterior from $\frac{1}{3}$ of costa to $\frac{2}{3}$ of inner margin, concave, posterior from $\frac{2}{3}$ of costa to $\frac{3}{4}$ of inner margin, somewhat curved near costa, median third forming a short broad somewhat bidentate projection; subterminal slender, waved, paler, with some whitish scales: cilia fuscous, terminal half obscurely barred with whitish, in ♀ with white, and base suffused with ochreous. Hindwings with hindmargin rounded; light dull orange-ochreous, irrorated with fuscous, and with numerous suffused obscure fuscous transverse lines, three towards middle more distinct, posterior somewhat bent and sinuate; posterior third more or less wholly suffused with rather dark fuscous; cilia as in forewings.

Mount Kosciusko (5700 feet), New South Wales, in January; locally common.

42. *Hydr. lamprotis*, n.sp.

♂♀. 20-21 mm. Head, palpi, thorax, abdomen, and legs dark fuscous, irrorated with whitish; palpi $2\frac{1}{2}$. Antennæ grey. Forewings triangular, hindmargin waved, bowed, rather oblique; fuscous, suffused with pale reddish-ochreous, and densely irrorated with blackish, forming slightly waved transverse lines; an indistinct almost straight whitish line about $\frac{1}{5}$; median band suffused

with dark fuscous, limited by hardly waved white lines, anterior from beyond $\frac{1}{3}$ of costa to $\frac{2}{3}$ of inner margin, almost straight, posterior from before $\frac{1}{3}$ of costa to $\frac{2}{3}$ of inner margin, slightly waved, median third forming a strong acute equilateral triangular projection; sometimes a second similar whitish line immediately beyond this; subterminal slender, waved, white in middle and towards costa, elsewhere obscure, preceded by a blackish suffusion, which forms a blotch above middle extending to hindmargin, margined above by an indistinct oblique whitish apical streak; all white markings sometimes partially suffused with grey; a blackish hindmarginal line: cilia fuscous barred with dark fuscous, base and a median line sprinkled with white. Hindwings with hindmargin strongly waved, rounded; light fulvous-ochreous, in ♂ more yellowish in disc, irrorated with fuscous, with obscure waved fuscous transverse lines, darker and more distinct on posterior half, towards hindmargin forming a more or less suffused band; on inner margin these are darker fuscous, and separated by white scales; a blackish hindmarginal line, cilia white, with a grey median line and indistinct grey bars, terminal half distinctly rosy tinged.

Bathurst (2700 feet), New South Wales; Melbourne, Victoria, Mount Lofty, South Australia; in February, four specimens. One of my specimens has, in one forewing only, the areole simple; this is an individual abnormality, caused by the non-development of the basal portion of vein 10, viz., that which extends from its origin to its anastomosis with 11, and is to be regarded as a diseased modification only.

43. *Hydr. constipata*, Walk.

(*Cidaria constipata*, Walk. 1405; *C. bifusata*, ib. 1406.)

♂♀. 29-31 mm. Head and thorax brownish-ochreous irrorated with blackish. Palpi in ♂ 1 $\frac{1}{2}$, in ♀ 2, dark grey, becoming white towards base. Antennæ grey, in ♂ filiform, ciliations $\frac{1}{2}$. Forewings triangular, hindmargin waved, somewhat bowed, hardly oblique; ochreous-fuscous, with a slight purple gloss, with

numerous waved dark fuscous lines; median band more or less suffusedly irrorated with grey-whitish, especially on a central fascia, including a short linear transverse black discal mark, anterior edge formed by a fascia of three waved nearly straight dark fuscous lines, often suffused together with blackish, posterior edge limited by a fine waved blackish line obscurely edged posteriorly with whitish, from $\frac{2}{3}$ of costa to $\frac{3}{4}$ of inner margin, rather curved outwards, median third forming a rather stronger bidentate curve; subterminal slender, waved, whitish, preceded and sometimes partially obscured by a dark fuscous suffusion; a short oblique dark fuscous suffused streak from apex; an interrupted blackish hindmarginal line: cilia fuscous, with obscure darker bars, terminal half and base sprinkled with whitish. Hindwings with hindmargin strongly waved, rounded; ochreous-fulvous, paler towards costa; a fuscous discal dot; very faint indications of fuscous transverse lines, more distinct on inner margin; a distinct darker fuscous subterminal shade; a dark fuscous hindmarginal line; cilia whitish, basal half ochreous-tinged, with obscure fuscous bars.

Bathurst, New South Wales; also from Tasmania; six specimens received from Mrs. Stephenson.

44. *Hydr. synchora*, n.sp.

♀. 34 mm. Head, palpi, and thorax ochreous-brownish, sprinkled with whitish and dark fuscous; palpi $2\frac{1}{2}$, base whitish. Antennæ fuscous. Abdomen pale greyish-ochreous irrorated with fuscous. Legs ochreous-whitish irrorated with fuscous. Forewings triangular, hindmargin waved, somewhat bowed, hardly oblique; light ochreous-brown, with more or less defined waved blackish transverse lines; a slender curved whitish line about $\frac{1}{5}$; a median band formed by two fasciæ of ground colour enclosing a well-defined central whitish band, in which is a black discal dot, limited by fine waved whitish inwardly blackish-edged lines, anterior from $\frac{1}{3}$ of costa to $\frac{2}{5}$ of inner margin, curved, posterior from before $\frac{3}{4}$ of costa to $\frac{4}{5}$ of inner margin, somewhat curved near

costa, forming a moderate round-pointed subtriangular projection in middle, above which is a sharp triangular indentation; subterminal obscurely whitish, meeting a short whitish oblique suffusion from apex; veins sprinkled with whitish near hindmargin; an interrupted blackish hindmarginal line: cilia ochreous-brownish, terminal half sprinkled with whitish, obscurely barred with darker fuscous. Hindwings with hindmargin strongly waved, rounded; light yellowish-ochreous, sprinkled with fuscous; a median band of four cloudy fuscous waved and sinuate lines, somewhat angulated in middle; a cloudy fuscous hindmarginal band, intersected by pale subterminal line; a blackish hindmarginal line; cilia pale ochreous, terminal half whitish, with a cloudy fuscous median line and obscure fuscous bars.

Hobart, Tasmania; one specimen in December.

45. *Hydr. aglaodes*, n sp.

♂. 28 mm. Head, palpi, and thorax blackish-grey, irrorated with whitish; palpi $1\frac{1}{2}$. Antennæ grey, slightly subdentate, ciliations $\frac{1}{2}$. Abdomen fuscous, mixed with blackish, ochreous yellow, and ochreous-whitish. Legs dark fuscous, apex of joints whitish-ochreous, posterior pair suffused with whitish-ochreous. Forewings triangular, hindmargin waved, bowed, somewhat oblique; dark grey, finely irrorated with blackish and whitish. basal area marked with indistinct slightly waved darker lines. median band limited anteriorly by a gently curved fascia of two slightly waved blackish-grey lines from $\frac{2}{3}$ of costa to $\frac{2}{3}$ of inner margin, posteriorly by a similar fascia from beyond middle of costa to $\frac{2}{3}$ of inner margin, curved outwards near costa, and forming a rather short and narrow strongly bidentate projection in middle, followed by two subconfluent whitish lines suffused with grey on lower half; a blackish median discal dot; terminal area finely irrorated with ochreous-yellowish; subterminal line slender, waved, whitish, partially obscured, preceded by an incomplete suffused darker shade. a blackish hindmarginal line: cilia grey, sprinkled with whitish, with faint darker bars. Hindwings with hindmargin

waved, rounded ; bright orange, paler towards costa ; dorsal third marked with cloudy dark fuscous transverse lines, with some whitish scales ; a rather narrow dark fuscous suffused band along lower $\frac{2}{3}$ of hindmargin ; cilia fuscous-grey sprinkled with whitish, becoming pale orange on upper third of hindmargin.

Mount Kosciusko (4700 feet), New South Wales ; one specimen in January.

46. *Hydr. imperviata*, Walk.

(*Larentia imperviata*, Walk. 1196.)

♀. 22 mm. Head, palpi, and thorax fuscous, sprinkled with fuscous-whitish and dark fuscous ; palpi $1\frac{1}{2}$. Forewings triangular, hindmargin waved, hardly bowed, rather oblique ; light fuscous, mixed with ochreous, and irrorated with blackish, forming numerous irregular waved transverse lines ; median band with anterior edge little marked, running from beyond $\frac{1}{3}$ of costa to $\frac{2}{5}$ of inner margin, curved, posterior edge running from $\frac{2}{4}$ of costa to $\frac{1}{5}$ of inner margin, irregularly curved near costa, with a median projection consisting of a short broad base emitting two narrow rounded projecting teeth or short bars, limited by a well-marked fascia of two subconfluent white lines interrupted by the median teeth ; subterminal waved, hardly paler, becoming whitish near costa, preceded by a darker shade ; a blackish hindmarginal line : cilia fuscous sprinkled with whitish, with faint darker median line and bars. Hindwings with hindmargin waved, rounded ; light fuscous, irrorated with darker ; posterior $\frac{2}{3}$ marked with faint waved darker transverse lines, subconfluent towards hindmargin ; hindmarginal line and cilia as in forewings.

Mount Lofty, South Australia ; one specimen received from Mr. E. L. Guest.

47. *Hydr. heteroleuca*, n.sp.

♂♀. 23-31 mm. Head, palpi, and thorax brownish-ochreous, densely irrorated with fuscous ; palpi $2\frac{1}{4}$, base whitish. Antennæ whitish-fuscous, in ♂ filiform, ciliations $\frac{1}{3}$. Abdomen whitish-fuscous irrorated with fuscous, sides more whitish. Legs whitish-ochreous irrorated with dark fuscous. Forewings triangular,

hindmargin slightly waved, hardly bowed, somewhat oblique; ochreous-brown, irrorated with dark fuscous, forming obscure waved transverse lines; median band somewhat darker, edges waved and more or less marked with white dots, anterior from $\frac{1}{3}$ of costa to $\frac{2}{3}$ of inner margin, rather curved, posterior from $\frac{2}{3}$ of costa to $\frac{1}{3}$ of inner margin, somewhat curved near costa, without projection, including a snow-white median discal dot, sometimes enlarged into a white spot containing a black dot and with one or two smaller white spots towards inner margin, or sometimes the whole median band, except narrow dark limiting fasciæ, occupied by a broad sharply defined white central band including a black discal dot; a fine obscurely paler waved subterminal line, marked with white dots towards costa; a dark fuscous hindmarginal line: cilia ochreous-brown, irrorated with dark fuscous. Hindwings with hindmargin waved, rounded; deep ochreous-yellow, lighter towards costa, dorsal third suffused with pale whitish-fuscous, and marked with cloudy transverse rather dark fuscous lines, a moderate dark fuscous suffusion along lower half of hindmargin; a blackish interrupted hindmarginal line on lower half; cilia fuscous, with a cloudy darker line, becoming ochreous-yellow on upper part of hindmargin and round apex.

Mount Kosciusko (4700 feet), New South Wales; Warragul, Victoria; in January, four specimens. All of these differ from one another in the extent of the white median marking, which is excessively variable.

48. *Hydr. doliope*, n.sp.

♂. 28 mm. Head, palpi, and thorax ochreous-brown, sprinkled with dark fuscous; palpi 2, base whitish. Antennæ fuscous, subdentate, ciliations 1. Forewings triangular, hindmargin waved, somewhat bowed, oblique; reddish-ochreous-brown, suffusedly irrorated with grey, with waved blackish transverse lines; median band hardly darker, anterior edge from $\frac{2}{3}$ of costa to $\frac{2}{3}$ of inner margin, hardly curved, posterior edge from $\frac{1}{3}$ of costa to $\frac{2}{3}$ of inner margin, rather curved near costa, median third forming a short

broad bidentate projection ; a blackish hindmarginal line : cilia light fuscous, basal half dark grey except base. Hindwings with hindmargin waved, rounded ; ochreous-orange ; dorsal half irrorated with fuscous, and marked with transverse darker fuscous lines ; a rather dark fuscous suffused band along hindmargin, becoming attenuated towards apex ; cilia as in forewings, becoming light yellowish round apex.

Mount Lofty, South Australia ; one specimen received from Mr. E. L. Guest. It is extremely similar to *H. languescens*, but certainly specifically distinct by the different structure of the antennæ ; it differs also in the more oblique hindmargin of forewings, the projection of the median band, the absence of whitish lines, and other minor points.

49. *Hydr. languescens*, Ros.

(*Coremia languescens*, Ros., Ann. Mag. N. H. 1885, 433, pl. xi, 8.)

♂. 25 mm. Head, palpi, and thorax reddish-brown, mixed with dark fuscous and whitish-fuscous ; palpi 2, base fuscous-whitish. Antennæ fuscous, filiform, ciliations $\frac{1}{2}$. Forewings triangular, hindmargin rather strongly waved, somewhat bowed, rather oblique ; red-brown, irrorated with grey, with waved blackish transverse lines ; costal edge rosy-whitish between lines ; median band limited by very fine obscure irregular whitish lines, anterior from $\frac{2}{3}$ of costa to $\frac{1}{3}$ of inner margin, gently curved, posterior from $\frac{2}{3}$ of costa to $\frac{2}{3}$ of inner margin, hardly curved, median third slightly curved outwards, central area of band grey, marginal areas somewhat darker red-brown ; subterminal slender, waved, whitish, interrupted, preceded by a blackish suffusion ; a black hindmarginal line : cilia whitish-rosy, with a faint grey subapical line, basal half dark grey except base, which is sprinkled with white. Hindwings with hindmargin waved, rounded ; yellow-orange, lighter towards costa ; dorsal third suffused with reddish-brown and marked with lines of blackish irroration, and

with postmedian and subterminal white lines; a suffused reddish-brown fascia, irrorated with blackish, extending along lower $\frac{2}{3}$ of hindmargin; hindmarginal line and cilia as in forewings, but cilia becoming pale ochreous-yellow round apex.

Melbourne, Victoria; one specimen received from Dr. Lucas.

50. *Hydr. orthropis*, n.sp.

♀. 28 mm. Head, palpi, and thorax brownish-ochreous, sprinkled with whitish; palpi 2. Antennæ fuscous-whitish. Abdomen and legs fuscous-whitish irrorated with fuscous. Forewings triangular, hindmargin hardly waved, somewhat bowed, rather oblique; brownish-ochreous, faintly reddish-tinged, suffused with pale grey and densely irrorated with fuscous, forming numerous obscure slightly waved lines; median band slightly darker, limited by very obscure slender interrupted whitish lines, anterior from $\frac{1}{3}$ of costa to $\frac{1}{3}$ of inner margin, somewhat curved, posterior from $\frac{2}{3}$ of costa to $\frac{2}{3}$ of inner margin, slightly curved, not projecting; subterminal line indicated by faint whitish dots: cilia brownish-ochreous mixed with dark grey (imperfect). Hindwings with hindmargin waved, rounded; colour and markings as in forewings, but dark lines of median band more marked, and costal $\frac{1}{3}$ of wing wholly suffused with whitish.

Mount Kosciusko (4500 feet), New South Wales; in January, one specimen.

51. *Hydr. microcyma*, n.sp.

♂♀. 21-22 mm. Head whitish-ochreous. Palpi $1\frac{1}{2}$, whitish-ochreous, irrorated with dark fuscous. Antennæ ochreous-whitish, in ♂ rather stout, tolerably filiform, ciliations $\frac{1}{2}$. Thorax whitish-ochreous, anterior margin dark purple fuscous. Abdomen whitish-ochreous, with a double series of dark fuscous dots on back. Legs ochreous-whitish, anterior and middle pairs irrorated with dark fuscous. Forewings triangular, hindmargin rather strongly waved, bowed, rather oblique; whitish-ochreous, more ochreous posteriorly and along costa, with numerous regular waved light greyish-fuscous transverse lines; a dark purple-fuscous streak along anterior half

of costa, posteriorly attenuated; a curved series of blackish dots near base; median band limited by two series of blackish dots, more or less white-edged externally, anterior from $\frac{1}{3}$ of costa to $\frac{1}{3}$ of inner margin, curved, posterior from before $\frac{3}{4}$ of costa to $\frac{3}{4}$ of inner margin, slightly curved and irregular but hardly projecting; a subterminal series of minute blackish dots, posteriorly white-edged; a black hindmarginal line: cilia whitish-ochreous, with two broad cloudy fuscous lines, base sprinkled with white. Hindwings with hindmargin rounded, strongly waved, with apical and median teeth more marked; colour and markings (except costal streak) as in forewings, but dots near base obsolete, postmedian series of dots slightly angulated in middle.

Campbelltown and Georges Bay, Tasmania; Mount Lofty, South Australia; in December, four specimens.

52. *Hydr. polycarpa*, n.sp.

♂♀. 26-28 mm. Head, thorax, and palpi black, mixed with yellowish hair-scales; palpi $2\frac{1}{4}$, becoming whitish-yellowish towards base. Antennæ blackish, in ♂ filiform, ciliations $\frac{1}{4}$. Abdomen black, irrorated with ochreous-yellow towards sides, segmented margins yellow-whitish. Legs whitish-yellowish, irrorated with black. Forewings triangular, hindmargin hardly waved, gently rounded, rather oblique; blackish-fuscous, suffusedly mixed with fuscous-crimson, the dark ground-colour forming irregular transverse lines; a few whitish scales at base, and sometimes in centre of disc; a nearly straight irregular ochreous-white line at $\frac{1}{5}$; median band limited by two broad ochreous-white irregular-edged fascia-like lines, anterior from beyond $\frac{1}{3}$ of costa to before middle of inner margin, nearly straight, posterior from $\frac{3}{4}$ of costa to beyond $\frac{3}{4}$ of inner margin, median third forming a short subtriangular projection; a moderate waved irregular ochreous-white subterminal line, sometimes interrupted: cilia blackish-grey, base mixed with dull crimson, terminal half barred with yellowish-white. Hindwings with hindmargin slightly waved, rounded;

bright orange; base suffused with dark fuscous, produced along inner margin to middle; two or three irregular sometimes interrupted dark fuscous lines before middle; a broad blackish-fuscous hindmarginal band, containing an irregular broad sometimes interrupted orange subterminal line; cilia whitish-yellowish, barred with blackish-grey.

Mount Kosciusko (5000-6000 feet), New South Wales; in January, common. This and the three following species, which are related together but very distinct, are very handsome; all were plentiful on the mountain, and probably the Gippsland ranges will furnish other allied species of the group.

53. *Hydr. oxygona*, n.sp.

♂♀. 26-28 mm. Head and palpi light ochreous-yellowish, irrorated with blackish; palpi $1\frac{2}{3}$. Antennæ dark fuscous, in ♂ filiform, ciliations $\frac{3}{4}$. Thorax dark fuscous. Abdomen rather dark grey, sprinkled with pale yellowish towards sides. Legs dark grey, sprinkled with pale yellowish. Forewings triangular, hindmargin slightly waved, somewhat bowed, rather oblique; uniform dark fuscous; sometimes a pale yellowish dot on costa at $\frac{1}{5}$; two rather narrow smooth-edged light ochreous yellow fasciæ, first from $\frac{1}{3}$ of costa to middle of inner margin, almost straight, posterior edge white, second from $\frac{2}{3}$ of costa to $\frac{3}{4}$ of inner margin, acutely angulated in middle, both halves slightly sinuate inwards, anterior edge white; a short whitish-yellowish mark from costa near apex: cilia dark fuscous. Hindwings with hindmargin slightly waved, rounded; orange, basal fourth fuscous; two cloudy dark fuscous lines before middle, more or less obsolete on costal half; a dark fuscous fascia at $\frac{1}{2}$, interrupted in middle, separated by a cloudy line of ground-colour from a narrow dark fuscous hindmarginal fascia; cilia dark grey, round apex pale yellowish, sometimes with a whitish-yellowish spot in middle of hindmargin.

Mount Kosciusko (4000-6500 feet), New South Wales; in January, common.

54. *Hydr. stereozona*, n.sp.

♂♀. 21-22 mm. Head, palpi, and thorax black, densely mixed with ochreous-yellow; palpi $2\frac{1}{4}$. Antennæ blackish-grey, in ♂ filiform, ciliations $\frac{1}{2}$. Abdomen blackish, irrorated with ochreous-yellow, segmental margins yellow-whitish. Legs blackish-grey, irrorated with whitish-yellowish. Forewings triangular, hindmargin hardly waved, somewhat bowed, rather oblique; uniform blackish-fuscous; some yellow scales near base, sometimes forming a distinct line; a straight yellow transverse line at $\frac{1}{5}$; two yellow somewhat irregular-edged narrow fasciæ or broad lines, rather variable in position and approximation, first antemedian, straight, second postmedian, almost acutely angulated in middle, both halves somewhat sinuate inwards; sometimes a yellow discal mark between these; a short slender yellow transverse streak from costa near apex: cilia dark fuscous, with several narrow pale yellowish bars, sometimes almost obsolete. Hindwings with hindmargin slightly waved, rounded; dark fuscous; a cloudy orange fascia near base, sometimes almost obsolete; a straight rather oblique orange fascia or thick line before middle; an angulated orange fascia beyond middle; sometimes a cloudy orange discal spot before this; rarely a slender orange interrupted subterminal line, usually reduced to a median dot; cilia dark fuscous, more or less barred obscurely with whitish-yellowish.

Mount Kosciusko (5000-6000 feet), New South Wales; in January, common.

55. *Hydr. chrysocyma*, n.sp.

♂♀. 19-21 mm. Head, palpi, and thorax black, densely mixed with yellowish; palpi $2\frac{1}{2}$. Antennæ dark grey, in ♂ filiform, ciliations $\frac{2}{3}$. Abdomen blackish, irrorated with yellowish, segmental margins yellow-whitish. Legs blackish, irrorated with whitish-yellowish. Forewings triangular, hindmargin hardly waved, somewhat bowed, rather oblique; blackish-fuscous, with a few scattered orange scales; base sprinkled with orange; a straight strong orange line about $\frac{1}{5}$; a broad orange line from $\frac{1}{3}$ of costa to

$\frac{2}{3}$ of inner margin, straight or somewhat irregularly bent outwards below middle; a narrow orange median line, generally broken into three or four spots; a broad orange line from $\frac{2}{3}$ of costa to $\frac{1}{3}$ of inner margin, sinuate outwards beneath costa, median third forming a moderate triangular projection outwards; an irregular orange subterminal line, broken into about four spots: cilia dark fuscous, with several more or less obscurely indicated yellow-whitish bars. Hindwings with hindmargin slightly waved, rounded; deep orange; base narrowly suffused with fuscous; a cloudy dark fuscous straight transverse line near base; two parallel dark fuscous median lines, slightly bent in middle, anterior sometimes partially obsolete; a moderate dark fuscous hindmarginal band, broader towards apex, containing a rather broad irregular orange subterminal line, sometimes interrupted or obsolete on upper half; cilia as in forewings.

Mount Kosciusko (5000-6000 feet), New South Wales; in January, common.

56. *Hydr. perornata*, Walk.

(*Lythria perornata*, Walk. 1056.)

♂♀. 27-28 mm. Head deep yellow-ochreous, face and forehead crimson. Palpi $2\frac{1}{4}$, yellow-ochreous, somewhat sprinkled with black. Antennæ dark grey spotted with whitish, in ♂ slightly subdentate, ciliations $\frac{1}{3}$. Thorax ochreous-orange, anterior margin crimson, sometimes forming two spots. Abdomen ochreous-yellow, sprinkled with dark grey on back, with a crimson spot at base. Legs ochreous-yellow, sprinkled with black. Forewings triangular, hindmargin hardly waved, somewhat bowed, rather oblique; deep ochreous, somewhat orange-tinged; a bright crimson streak along costa, costal edge sprinkled with black on anterior half, dorsal cilia crimson, a slender slightly curved crimson transverse line about $\frac{1}{4}$, marked with two or three blackish dots; a series of three or four blackish dots about $\frac{1}{3}$, and a sinuate series of about 8 blackish dots at $\frac{2}{3}$, somewhat projecting in middle, indicating margins of median band, between these is a moderate

crimson fascia, more or less mixed with blackish, sometimes interrupted above and below middle, its posterior edge angularly projecting in middle; a crimson subterminal line, interrupted in middle; a slender crimson streak along hindmargin: cilia with basal half blackish mixed with crimson, terminal half crimson-whitish barred with dark grey. Hindwings with hindmargin slightly waved, rounded; yellowish-orange; dorsal half from base to a cloudy dark grey line at $\frac{2}{3}$ sprinkled with dark grey; a rather broad blackish hindmarginal band, including cloudy yellowish-orange spots above apex, in middle, and at anal angle; cilia blackish-grey sprinkled with crimson, tips yellow-whitish.

Mount Kosciusko (5000-5800 feet), New South Wales; Mount Wellington, Tasmania; in January, four specimens.

57. *Hydr. mecynata*, Gn.

(*Camptogramma mecynata*, Gn. X, 424; *C. extraneata*, Walk. 1717; *C. annuliferata*, ib. 1717.)

♂♀. 22-27 mm. Head, thorax, and abdomen light brownish-ochreous, sprinkled with dark fuscous. Palpi $2\frac{1}{4}$, yellowish, mixed with fuscous. Antennæ fuscous, obscurely spotted with whitish, in ♂ slightly subdentate, ciliations $\frac{1}{3}$. Forewings triangular, hindmargin hardly waved, bowed, rather oblique; light brownish-ochreous, more or less irrorated with dark fuscous, with numerous waved fuscous or dark fuscous lines; costal edge bright ochreous-yellow; lines limiting median band somewhat darker, anterior somewhat curved, usually preceded by a broad brownish suffusion, posterior with upper $\frac{2}{3}$ rather strongly curved outwards; a dark fuscous median discal dot; subterminal line indicated by dark grey anterior margin, interrupted in middle; hindmargin beyond this suffused with brown, except towards costa; an interrupted dark fuscous hindmarginal line: cilia blackish-grey, base deep orange-ochreous, terminal half rosy-whitish. Hindwings with hindmargin slightly waved, rounded; deep ochreous-yellow, dorsal half irrorated with fuscous, sometimes wing wholly suffused with fuscous; three or four cloudy darker fuscous curved lines towards

middle; a moderate dark fuscous hindmarginal band, with indications of pale subterminal line at apex and anal angle; cilia dark grey, tips obscurely whitish-yellowish.

Sydney and Blackheath (3500 feet), New South Wales; Melbourne, Victoria; Deloraine and Launceston, Tasmania; from October to January, rather common.

58. *Hydr. insulsata*, Gn.

(*Campptogramma insulsata*, Gn. X, 423; *Aspilates spohata*, Walk. 1074.)

♂♀. 25-27 mm. Head, palpi, and thorax light yellow-ochreous, sprinkled with dark fuscous; palpi $2\frac{1}{4}$, base whitish-yellowish. Antennae dark grey spotted with whitish, in ♂ slightly subdentate, ciliations $\frac{5}{8}$. Abdomen whitish-yellowish, sprinkled with dark fuscous. Forewings triangular, hindmargin hardly sinuate, somewhat bowed, rather oblique, yellow-ochreous, irrorated with fuscous, with numerous slightly curved waved darker fuscous transverse lines; a dark fuscous median discal dot; a narrow fuscous suffusion along hindmargin; cilia grey, base mixed with ochreous, with a postmedian whitish-yellowish line. Hindwings with hindmargin waved, rounded; ochreous-yellow, in ♀ with faint transverse fuscous lines; hindmargin narrowly tinged or suffused with fuscous, cilia orange-ochreous, with an obscure darker grey median line, terminal half whitish-yellowish.

Mount Lofty and Port Lincoln, South Australia; according to Walker, also from Tasmania, which is probable; four specimens received from Mr. E. L. Guest and the Rev. T. Blackburn.

59. *Hydr. leucozona*, n.sp.

♂♀. 23-26 mm. Head and thorax deep ochreous. Palpi $2\frac{3}{4}$, yellow-ochreous sprinkled with dark fuscous, base white. Antennae grey spotted with whitish, in ♂ filiform, ciliations $\frac{1}{2}$. Abdomen ochreous or whitish-ochreous, segmental margins whitish. Legs whitish irrorated with dark fuscous. Forewings triangular, hindmargin waved, bowed, rather oblique, bright deep ochreous,

somewhat brownish-tinged, becoming yellower towards costa; a very fine somewhat curved white transverse line about $\frac{1}{5}$, margined with a few blackish scales; margins of median band indicated by two slightly waved very fine white lines, edged with blackish scales, sometimes partially interrupted or obscure, anterior somewhat angulated above middle, posterior slightly curved outwards in middle; between these is a snow-white slenderly black-margined central fascia, varying from very slender to moderately broad, anterior edge slightly concave, posterior forming a small rounded projection in middle, sometimes interrupted below middle; a whitish dot on costa before apex: cilia deep ochreous, with a dark grey median line, terminal half snow-white faintly barred with grey. Hindwings with hindmargin waved, rounded; ochreous-orange; hindmargin sometimes narrowly tinged with fuscous; a dark fuscous hindmarginal line; cilia fuscous, terminal half snow-white.

Mount Kosciusko (4500 feet), New South Wales; Ballarat, Mount Macedon, and Phillip Island, Victoria; Launceston and Deloraine, Tasmania; from November to January, locally common.

60. *Hydr. polyxantha*, n.sp.

♂. 25 mm. Head, palpi, and thorax deep ochreous-yellow; palpi $2\frac{1}{4}$, with a few fuscous scales. Antennæ dark grey spotted with whitish, slightly subdentate, ciliations $\frac{1}{2}$. Abdomen ochreous-yellowish. Legs ochreous-whitish, irrorated with dark fuscous. Forewings triangular, hindmargin hardly waved, bowed, rather oblique; deep ochreous-yellow; costa irrorated with dark fuscous near base; a slender somewhat curved interrupted line of dark fuscous scales about $\frac{1}{5}$; margins of median band indicated by two series of cloudy dark fuscous dots, anterior slightly bent above middle, posterior somewhat projecting in middle; between these is a moderate fuscous somewhat irregular-edged central fascia, margined with darker, anterior edge slightly concave, posterior forming a small subtriangular projection in middle; a rather narrow fuscous suffusion along hindmargin, attenuated to a point

at apex and anal angle: cilia wholly dark grey, above apex and below anal angle pale yellowish. Hindwings with hindmargin slightly waved, rounded; light ochreous-yellowish, deeper and more ochreous posteriorly; traces of a postmedian series of fuscous dots; a fuscous hindmarginal line; cilia pale yellowish, on lower half of hindmargin suffused with grey.

Mount Kosciusko (4000 feet), New South Wales; in January, two specimens.

61. *Hydr. correlata*, Walk.

(*Camptogramma correlata*, Walk. 1330.)

♂♀. 22-27 mm. Head, palpi, and thorax deep ochreous-yellow; palpi $2\frac{1}{2}$, with a few fuscous scales. Antennæ dark grey spotted with whitish, in ♂ slightly subdentate, ciliations $\frac{3}{4}$. Abdomen light ochreous-yellowish, sprinkled with dark fuscous. Forewings triangular, hindmargin hardly waved, bowed, rather oblique; deep ochreous-yellow, deeper along costa; a cloudy somewhat curved dark fuscous line about $\frac{1}{3}$, preceded and followed by two or three faint traces of similar lines, median band limited by rather dark fuscous fasciæ with waved margins, anterior narrow, curved, posterior rather broader, preceded by a partially confluent line, median third of posterior edge forming a moderate triangular subacute projection; a dark fuscous discal dot, and sometimes a fuscous discal suffusion between these; a hindmarginal band of faint fuscous irroration, margined anteriorly by an interrupted dark fuscous sinuate line or series of dots, and including a waved subterminal line of groundcolour, beyond which the hindmargin is sometimes suffused with darker fuscous except near costa; an interrupted dark fuscous hindmarginal line: cilia dark grey, basal half blackish-grey, with a faint slender partly obscured pale yellowish median line, beneath anal angle wholly yellow. Hindwings with hindmargin waved, rounded; rather light ochreous-yellow, deeper towards hindmargin; a dark grey discal dot; a cloudy fuscous angulated median line, sometimes very faint; sometimes one or two indistinct fuscous lines about $\frac{2}{3}$; a rather narrow fuscous or dark fuscous hindmarginal suffusion, attenuated

to apex and anal angle, sometimes nearly obsolete; cilia pale yellowish, basal half grey, terminal half obscurely suffused with grey on lower half of hindmargin.

Bathurst (2500 feet), New South Wales; Melbourne, Victoria; Launceston, Tasmania; Port Lincoln, South Australia; in November, rather common. This is given by Walker as a New Zealand insect, but erroneously.

62. *Hydr. ebuleata*, Gn.

(*Campptogramma ebuleata*, Gn. X, 424; *Cidaria fervidata*, Walk. 1408.)

♂♀. 23-25 mm. Head, palpi, thorax, and abdomen whitish-ochreous, yellowish-tinged, somewhat sprinkled with fuscous; palpi $2\frac{1}{2}$. Antennæ dark grey spotted with whitish, in ♂ slightly subdentate, ciliations $\frac{2}{3}$. Forewings triangular, hindmargin hardly waved, bowed, rather oblique; varying from whitish-ochreous to deep yellow-ochreous, sometimes with faint waved fuscous lines; a curved cloudy fuscous line about $\frac{1}{2}$; median band formed by two groups of waved fuscous lines, sometimes very faint, sometimes coalescing to form ochreous-fuscous dark-margined fasciæ, anterior curved, posterior forming a moderate subacute projection on median third; a dark fuscous median discal dot; a faint fuscous sinuate line beyond median band, marked with distinct darker fuscous dots; hindmarginal area beyond this usually more or less irrorated with fuscous, including a pale waved subterminal line; a faint short oblique pale streak from apex, margined beneath by a darker shade; an interrupted dark fuscous hindmarginal line: cilia dark grey suffused with ochreous towards base, terminal half white, with a grey spot at apex, rarely barred with grey. Hindwings with hindmargin slightly waved, rounded; pale ochreous-yellowish; sometimes traces of an angulated grey median line, and one or two grey marks at anal angle; sometimes an interrupted grey hindmarginal line; cilia ochreous-yellow, terminal half whitish.

Bathurst (2500 feet) and Mount Kosciusko (4000 feet), New South Wales; Launceston, Deloraine, and Campbelltown, Tasmania; from November to January, common.

63. *Hydr. uncinata*, Gn.

(*Camplogramma uncinata*, Gn. X, 424; *Panagra approximata*, Walk. 1002; *P. plurilineata*, ib. 1011; *P. intercalata*, ib. 1013; *Camplogramma replicata*, ib. 1330; *Panagra revulsaria*, ib. 1655; *Cidaria gallinata*, Feld., Reis. Nov. pl. cxxxi, 8.)

♂♀. 22-25 mm. Head, palpi, and thorax pale ochreous, more or less tinged with brownish or yellowish; palpi in ♂ $2\frac{1}{2}$, in ♀ $2\frac{1}{4}$. Antennæ whitish-ochreous, sometimes obscurely spotted with fuscous, in ♂ somewhat subdentate, ciliations $\frac{1}{2}$. Forewings triangular, costa faintly sinuate, hindmargin slightly sinuate beneath apex, bowed, rather oblique; light brownish-ochreous, brownish, light brownish-grey, or pale yellowish-ochreous; numerous faint waved darker lines, some often marked with darker or blackish dots on veins; costal edge more or less reddish-ochreous; often a very irregular curved cloudy reddish brown line at $\frac{1}{2}$; median band sometimes suffused with dark reddish-brown, sometimes at extremities only, sometimes only margined with very indistinct cloudy fuscous shades, in ♂ usually greatly narrowed towards inner margin, in ♀ broader, anterior edge slightly curved, posterior edge slightly waved, forming a very short subobtuse projection in middle, a black median discal dot; a short waved reddish brown streak from costa near apex, and a short oblique rather dark fuscous streak from apex, often united into a triangular patch, sometimes little marked; a series of short dark fuscous marks along hindmargin: cilia ochreous brown, fuscous, or deep yellow-ochreous, terminal half whitish, or rarely pale whitish-ochreous. Hindwings with hindmargin rounded; whitish-fuscous, or rarely whitish-ochreous, fuscous-tinged, sometimes some faint waved fuscous lines posteriorly; cilia fuscous, whitish-fuscous, or yellow ochreous, terminal half fuscous whitish or ochreous-whitish.

Sydney and Bathurst (2300 feet), New South Wales; Georges Bay, Tasmania; Mount Lofty, South Australia; Geraldton, Perth, and Albany, West Australia; from August to December, generally common. This is a really variable species, in respect of colour but is notwithstanding always easy to recognise by the somewhat

64. *Hydr. subochraria*, Dbld.

(*Aspilates subochraria*, Dbld., Dieff. N. Zeal. ii, 285, Butl. N.Z. Cat. pl. iii, 16, Meyr. Trans. N.Z. Inst. 1883, 73 (*Arsinoe*); *Camptogramma strangulata*, Gn. X, 423; *Aspilates euboliaria*, Walk. 1684; *Camptogramma fuscinata*, Gn. Ent. Mo. Mag. V, 92.)

♂♀. 25-29 mm. Head light fuscous, collar and sides of face deep ochreous-yellow. Palpi $2\frac{1}{4}$, deep yellow-ochreous, base yellow-whitish. Antennæ pale yellowish-fuscous, in ♂ deeply dentate, ciliations $\frac{2}{3}$. Thorax deep ochreous-yellow, anterior margin fuscous, rarely wholly light fuscous. Forewings triangular, costa faintly sinuate, hindmargin entire, bowed, rather oblique; deep ochreous-yellow, costa and hindmargin suffused with fuscous, sometimes posterior half or even whole wing suffused with light fuscous; faint traces of waved darker lines; median band with anterior edge very faint, indented below middle, posterior edge formed by a fuscous fascia, dilated near inner margin, anteriorly suffused, posteriorly well-defined by a whitish-fuscous line, slightly curved outwards on upper $\frac{2}{3}$; a black median discal dot: cilia pale fuscous, basal half suffused with deep ochreous. Hindwings somewhat elongate, hindmargin faintly waved, rounded; pale ochreous-yellowish, sometimes fuscous-tinged; sometimes faint traces of waved fuscous lines posteriorly; cilia pale ochreous-yellowish, sometimes fuscous-tinged.

Toowoomba (2000 feet), Queensland; Glen Innes (3500 feet), Bathurst (2500 feet), Sydney, and Cooma (4000 feet), New South Wales; Ballarat and Melbourne, Victoria; Deloraine and Hobart, Tasmania; from October to April, generally common. It occurs also freely throughout New Zealand.

65. *Hydr. trygodes*, n.sp.

♂. 24 mm. Head, palpi, antennæ, thorax, abdomen, and legs fuscous, reddish-tinged; palpi $2\frac{1}{4}$; antennæ triangularly dentate, ciliations $\frac{2}{3}$; legs sprinkled with ochreous-whitish. Forewings triangular, hindmargin waved, bowed, rather oblique; rather dark fuscous, mixed with dull ferruginous-reddish, especially before and beyond median band, and slightly sprinkled with whitish, with

numerous faint waved darker transverse lines; margins of median band indicated by series of minute white dots, anterior slightly curved, posterior from $\frac{1}{2}$ of costa to $\frac{3}{4}$ of inner margin, somewhat sinuate above and below middle so as to form a slight median projection; a blackish median discal dot; a faint waved subterminal line indicated by whitish scales: cilia reddish-grey with two broad dark grey lines, tips whitish barred with reddish-grey. Hindwings elongate, hindmargin waved, unevenly rounded; light grey, becoming purplish-tinged posteriorly, with faint traces of darker lines; cilia rosy-grey, basal half darker, tips partly whitish.

Georges Bay, Tasmania, in December; two specimens.

66. *Hydr. decreta*, Walk.

(*Cidaria decreta*, Walk. Suppl. 1692.)

♀. 20 mm. Head, palpi, thorax, and abdomen fuscous, mixed with blackish and grey-whitish; palpi $1\frac{1}{2}$. Antennæ fuscous. Forewings rather elongate-triangular, hindmargin slightly waved, bowed, oblique; fuscous, mixed with dark reddish-fuscous and pale ochreous, two nearly straight obscure pale brownish-ochreous lines about $\frac{1}{6}$, preceded by a black line; median band finely margined with black, preceded and followed by pairs of pale brownish-ochreous lines, anterior from $\frac{2}{3}$ of costa to $\frac{1}{2}$ of inner margin, rather curved, posterior from $\frac{3}{4}$ of costa to $\frac{3}{4}$ of inner margin, upper half forming an obtuse angle with lower in middle and twice sinuate so as to project at $\frac{1}{4}$ from costa; an obscure pale waved subterminal line, an interrupted black hindmarginal line: cilia pale brownish-ochreous, strongly barred with dark grey, with a cloudy dark reddish-fuscous median line. Hindwings with hindmargin waved, rounded, pale grey, with a median band of four darker grey lines, posterior obtusely angulated in middle and partly blackish, a fifth grey line beyond this; a rather dark reddish-fuscous hindmarginal band, including a very obscure pale waved subterminal line, an interrupted black hindmarginal line: cilia whitish ochreous, obscurely barred with grey, with a dull reddish median line.

Girdler, West Australia, in November: two specimens.

67. *Hydr. cryeropa*, n.sp.

♂. 25-26 mm. Head, palpi, and thorax fuscous, sprinkled with white; palpi $1\frac{2}{3}$. Antennæ whitish-fuscous, slightly subdentate, ciliations $\frac{2}{3}$. Abdomen and legs whitish, irrorated with rather dark fuscous. Forewings triangular, hindmargin slightly waved, bowed, oblique; rather light fuscous, more or less densely irrorated with white; a basal patch of three or four faint darker lines, outermost darker fuscous and bent near costa; median band limited by fine slightly irregularly waved blackish lines, anterior from $\frac{2}{3}$ of costa to $\frac{2}{3}$ of inner margin, curved, angularly indented below costa and on submedian fold, followed by a fuscous line, posterior from $\frac{3}{4}$ of costa to $\frac{3}{4}$ of inner margin, median third forming an acute triangular projection, preceded by two dark fuscous lines, and followed by two or three subconfluent white lines; a blackish median discal dot; a faint waved whitish subterminal line; an oblique sinuate whitish streak from apex, margined beneath by a dark fuscous suffusion; an interrupted dark fuscous hindmarginal line: cilia whitish-fuscous, tips white, with a white bar at apex. Hindwings and hindmargin somewhat waved, rounded; pale whitish-fuscous, ochreous-tinged; a faint darker angulated postmedian line; a faint darker hindmarginal suffusion, preceded by a very indistinct whitish subterminal line; cilia whitish-ochreous, tips whitish.

Hay, New South Wales; two specimens received from Mr. G. H. Raynor.

68. *Hydr. mortuata*, Gn.

(*Camptogramma mortuata*, Gn. X, 428; *Cidaria clandestinata*, Walk. 1408.)

♂♀. 21-26 mm. Head, palpi, thorax, and abdomen dark grey, sprinkled with grey-whitish; palpi in ♂ $1\frac{2}{3}$, in ♀ $2\frac{1}{4}$, base whitish. Antennæ grey, in ♂ filiform, ciliations $\frac{1}{3}$. Forewings triangular, hindmargin waved, bowed, oblique; grey, sprinkled with blackish-grey and whitish, with numerous waved darker lines, sometimes partially tinged with reddish-ochreous; a basal patch and median

band sometimes darker, especially on margins, sometimes concolorous; outer edge of median band from $\frac{3}{4}$ of costa to $\frac{3}{4}$ of inner margin, somewhat marked with black on veins, and margined with a series of white dots, faintly curved near costa, forming a short subtriangular projection in middle; a small black median discal dot; sometimes a cloudy darker quadrate patch towards hindmargin above middle; a blackish hindmarginal line: cilia fuscous, more or less sprinkled with whitish, with cloudy darker fuscous bars. Hindwings with hindmargin rounded, in ♂ waved, in ♀ crenulate; fuscous-grey, with more or less obscure darker lines, towards inner margin more strongly marked and partially separated with whitish scales; hindmarginal line and cilia as in forewings.

Sydney and Blackheath (3500 feet), New South Wales; Melbourne, Victoria, Georges Bay, Tasmania; Mount Lofty South Australia; from October to April, generally common.

69 *Hydr. severata*, Gn.

(*Camplogramma severata*, Gn. X, 438; *Phibalapteryx perfectata*, Walk. 1341, *Scotosia scitiferata*, ib. 1357; *Cidaria promptata*, ib. 1410)

♂♀. 25-28 mm. Head grey, mixed with white and spotted with black. Palpi in ♂ $1\frac{2}{3}$, in ♀ 2, blackish, becoming whitish towards base. Antennae grey, in ♂ filiform, ciliations $\frac{1}{4}$. Thorax fuscous mixed with whitish, with three transverse blackish bars. Abdomen grey irrorated with whitish and dark grey, segmental margins with blackish bars, basal segment white except black marginal bar. Forewings triangular, hindmargin strongly waved, bowed, oblique; fuscous grey, densely irrorated with white, with numerous more or less strongly marked somewhat irregularly sinuate but hardly waved lines of blackish irroration; a stronger anteriorly suffused somewhat curved line from $\frac{1}{3}$ of costa to $\frac{1}{4}$ of inner margin; median band somewhat darker on margins and on lower half, limiting lines more or less suffused internally with black, especially in middle, anterior from middle of costa to before middle of inner

margin, slightly curved, posterior from $\frac{1}{8}$ of costa to $\frac{3}{4}$ of inner margin, almost straight, somewhat sinuate outwards or very slightly projecting in middle; beyond this are usually spots of ferruginous suffusion in and above middle and on inner margin; a black median discal dot; an obscure oblique darker suffusion beneath apex; subterminal line slender, whitish, hardly waved, often obscure; a black hindmarginal line: cilia fuscous-grey, with basal, median, and apical whitish lines, and faint darker bars. Hindwings with hindmargin strongly waved, rounded; fuscous-grey, posterior $\frac{2}{3}$ with numerous somewhat darker transverse lines, becoming more strongly marked and partially separated with whitish scales on dorsal half; often a dark fuscous discal dot; a whitish somewhat waved subterminal line; hindmarginal line and cilia as in forewings.

Sydney and Bathurst (2500 feet), New South Wales; Campbelltown and Hobart, Tasmania; Mount Lofty, South Australia; Albany, West Australia; from July to December, generally common.

70. *Hydr. brujata*, Gn.

(*Scotosia brujata*, Gn. X, 444; *S. albinotata*, Walk. Suppl. 1689.)

♀. 35 mm. Head, palpi, antennæ, thorax, and abdomen fuscous; palpi $1\frac{1}{2}$; thorax sometimes white except anterior and posterior margins; abdomen sometimes with white basal band. Forewings triangular, hindmargin strongly waved, bowed, oblique; brownish-ochreous, densely irrorated with dark fuscous, appearing to form numerous obscure curved slightly waved darker lines; posterior edge of median band formed by a series of white dots, from beyond $\frac{2}{3}$ of costa to $\frac{2}{3}$ of inner margin, angulated so as to project obtusely in middle; a white spot or longitudinal suffusion extending more or less completely from angle of this projection to middle of hindmargin; a subterminal series of white dots; sometimes there are numerous irregular partially confluent white blotches towards costa and base, and scattered white scales in disc: cilia brownish-ochreous mixed with dark fuscous. Hindwings with hindmargin dentate; colour and markings as in forewings, but without white costal or basal blotches.

Sydney, New South Wales, in October ; one specimen received from Mr. G. H. Raynor. I cannot positively determine whether I am correct in identifying my specimen with Guénée's and Walker's species, for want of material ; but I have no doubt that the great preponderance of white marking, which characterises my specimen, is an inconstant and variable point, which could not be relied on for distinction ; and, on the whole, the balance of probability seems in favour of their identity.

71. *Hydr. leucophanes*, n.sp.

♂. 26 mm. Head and thorax brownish-ochreous. Palpi $2\frac{1}{4}$, pale ochreous, mixed with blackish. Antennæ whitish-ochreous, filiform, ciliations $\frac{1}{3}$. Abdomen light ochreous, segmental margins mixed with blackish. Legs whitish-ochreous irrorated with blackish. Forewings rather elongate triangular, hindmargin strongly waved, bowed, oblique, inner margin rather strongly rounded, light brownish-ochreous, with numerous slender indistinct rather irregular ochreous-brown lines, somewhat marked with blackish, especially on veins ; margins of median band very ill-defined, anterior formed by an indistinct slightly curved reddish-brown shade from $\frac{2}{5}$ of costa to before $\frac{1}{4}$ of inner margin, posterior by a slender indistinct line of blackish scales from $\frac{1}{3}$ of costa to $\frac{3}{4}$ of inner margin, followed by obscure whitish dots on veins, upper $\frac{1}{3}$ rather strongly curved outwards ; a black median discal dot ; a pale oblique streak from apex, terminating in a larger white dot on margin of median band, margined beneath by a fuscous suffusion ; a narrow fuscous suffusion along hindmargin, forming a small darker spot above anal angle ; cilia pale brownish-ochreous mixed with darker fuscous. Hindwings with hindmargin deeply waved, rounded ; ochreous-grey-whitish ; inner margin suffused with brownish-ochreous, marked with darker fuscous transverse lines, with one at $\frac{2}{3}$ more blackish and followed by whitish scales ; a faint fuscous suffusion towards hindmargin, a blackish hindmarginal line, cilia as in forewings.

Deloraine, Tasmania, in December ; one specimen.

15. MELITULIAS, n.g.

Face with short cone of projecting scales. Antennæ in ♂ ciliated. Palpi moderate, porrected, rough-scaled. Posterior tibiæ with all spurs present. Forewings with areole double. Hindwings with veins 6 and 7 stalked; in ♂ with a discal patch of modified yellow scales.

Only known from Australia; it is closely related to *Hydriomena*, but is naturally and conveniently separated. The modified discal yellow scales of the hindwings in the ♂, which are more or less dilated and form a somewhat thickened patch, evidently serve some other purpose than that of coloration, and are possibly scent-producing.

1. Median band of forewings margined with strong white lines..... 2.
 Median band of forewings not margined with strong white lines..... 73. *glandulata*.
2. Hindwings of ♂ with very large yellow discal patch..... 74. *discophora*.
 Hindwings in ♂ with small yellow discal spot 72. *graphicata*.

72. *Mel. graphicata*, Walk.

(*Tephрина graphicata*, Walk. 967.)

♂♀. 26-30 mm. Head dark ochreous-fuscous. Palpi in ♂ 2, in ♀ 2½, dark fuscous, base whitish. Antennæ dark grey, in ♂ filiform, ciliations ½. Thorax fuscous, with three dark ochreous-fuscous transverse bars. Abdomen whitish-fuscous irrorated with darker. Forewings triangular, hindmargin waved, bowed, rather oblique; bright ochreous-brown, with faint darker sinuate transverse lines; a subcostal streak of grey-whitish irroration from base to middle; median band sometimes suffused with dark fuscous, limited by strong ochreous-white lines sharply-marked and blackish-edged internally, more or less suffused with bright ochreous externally, anterior from ⅔ of costa to ⅓ of inner margin, nearly rectangularly angulated below middle, its arms connected by a

fine straight whitish line, posterior from $\frac{1}{4}$ of costa to $\frac{1}{2}$ of inner margin, sinuate inwards from $\frac{1}{4}$ to middle, and on lower half, so as to project slightly in middle; a small blackish median discal spot, surrounded by a ring of whitish irroration; a whitish subterminal line, indented below middle, more or less margined suffusedly with dark fuscous, usually interrupted in middle and beneath an oblique whitish streak from apex; a dark fuscous hindmarginal line: cilia light bronzy-fuscous, with obscure bars of whitish irroration. Hindwings with hindmargin in ♂ entire, in ♀ waved, rounded; light grey, somewhat darker posteriorly; in ♂ a small median discal spot of orange scales; in ♀ an obscure whitish subterminal line; cilia in ♂ unicolorous light grey, in ♀ light grey with darker grey bars alternating with whitish irroration.

Blackheath (3500 feet), New South Wales; Deloraine, Tasmania; in November and December, locally common, frequenting swampy places.

73. *Mel. glandulata*, Gn.

(*Phibalapteryx glandulata*, Gn. X, 439, pl. x, 6; *Eubolia undulata*, Ros., Ann. Mag. N.H. 1885, 432.)

♂♀. 23-27 mm. Head fuscous irrorated with whitish. Palpi $2\frac{2}{3}$, ochreous-fuscous, base white. Antennæ whitish fuscous, in ♂ filiform, ciliations $\frac{1}{3}$. Thorax fuscous sprinkled with whitish, anterior margin and a slender transverse median bar darker ochreous-fuscous. Abdomen whitish-ochreous irrorated with fuscous. Forewings triangular, hindmargin waved, rather strongly bowed, oblique; fuscous, irrorated with whitish, with numerous nearly straight fine dark fuscous lines, in ♂ partially more ochreous-tinged, costa in ♂ suffused with ochreous brownish from base to $\frac{2}{3}$, median band in ♂ limited by blackish fuscous lines suffused internally with ochreous-brown except towards costa, in ♀ hardly more marked than ordinary lines, anterior from middle of costa to before middle of inner margin, straight, posterior from $\frac{1}{4}$ of costa to $\frac{1}{4}$ of inner margin, faintly sinuate inwards above middle and above inner margin, and more strongly below middle, so as to form a slight median projection; a dark fuscous median discal

dot ; a short oblique dark fuscous apical dash, in ♂ connected with an irregular dark ochreous-brown subterminal suffusion extending downwards to middle ; a blackish hindmarginal line : cilia fuscous, with a whitish median line. Hindwings in ♂ narrowed and elongate, hindmargin entire, in ♀ normal, hindmargin strongly waved, rounded ; pale whitish-fuscous, more or less ochreous-tinged, in ♀ posteriorly with more or less indistinct darker lines, more marked on inner margin ; in ♂ a large oval patch of dense pale ochreous-yellowish scales, extending in disc from $\frac{1}{2}$ to $\frac{2}{3}$, and from near costa to below middle ; hindmarginal line and cilia as in forewings.

Melbourne, Victoria ; Hobart, Tasmania ; in November and December, rather common.

74. *Mel. discophora*, n.sp.

♂♀. 19-23 mm. Head, palpi, and thorax blackish, somewhat mixed with ochreous and whitish ; palpi $3\frac{1}{4}$. Antennæ blackish, in ♂ filiform, ciliations very minute, towards base absent. Abdomen blackish, sides and margins of segments suffused with whitish. Legs dark fuscous irrorated with whitish. Forewings somewhat elongate-triangular, apex somewhat prominent, hindmargin slightly waved, bowed, oblique ; blackish-fuscous, in ♂ densely strewn with golden-ochreous except on margins of white markings ; markings formed by a dense white irroration ; a small basal patch, outer edge curved ; a slightly curved fascia from $\frac{2}{5}$ of costa to $\frac{2}{5}$ of inner margin, sinuate outwards below middle ; a transverse series of three roundish spots (costal, median, and dorsal) beyond middle, sometimes connected by dark bars ; a broad line from $\frac{5}{8}$ of costa to before anal angle, strongly sinuate inwards above middle, and on lower third : cilia rather dark fuscous sprinkled with ochreous, sharply barred with snow-white. Hindwings somewhat elongate, hindmargin in ♂ hardly, in ♀ moderately waved, rounded ; pale fuscous, ochreous-tinged, towards hindmargin darker ; in ♂ a very large patch of pale ochreous-yellowish scales, suffused with deeper ochreous towards middle, extending over whole wing except a moderate marginal band all

round; in ♀ a faint pale fascia at $\frac{2}{3}$; cilia as in forewings, in ♂ much shortened and less sharply marked.

Mount Kosciuszko (5000-5500 feet), New South Wales; in January, common.

16. *ANOMOCENTRIS*, n.g.

Face with very small cone of scales. Tongue absent. Palpi short, stout, porrected, rough-scaled. Antennæ in ♂ bipectinated throughout, pectinations ending in tufts of long cilia. Posterior tibiae in both sexes without median spurs. Forewings with areole simple. Hindwings with veins 6 and 7 stalked.

Only the following very distinct species is at present known. It is doubtless to be regarded as a development from *Xanthorhoe*, with very well-marked distinguishing characters.

75. *Anom. crystallota*, n.sp.

♂♀ 15-16 mm Head white, face sprinkled with fuscous. Palpi dark fuscous, sprinkled with white. Antennæ whitish, pectinations fuscous. Thorax white, partially irrorated with dark fuscous. Abdomen whitish. Legs white, anterior and middle tibiae irrorated with dark fuscous. Forewings rather elongate-triangular, more elongate in ♀, apex somewhat prominent, hindmargin entire, rather bent in middle, oblique; pale fuscous, finely irrorated with darker; markings shining snow-white, partially somewhat edged with blackish-fuscous scales; a longitudinal streak above middle from base to $\frac{1}{2}$, posteriorly furcate, a streak along basal third of inner margin, a straight transverse streak before middle parallel to hindmargin, not reaching costa, a somewhat sinuate streak from $\frac{1}{2}$ of costa to $\frac{2}{3}$ of inner margin, emitting a strong tooth posteriorly in middle, above which it is sometimes interrupted by a spot of blackish-fuscous scales; a submarginal streak from apex to anal angle, sinuate so as to touch hindmargin below middle cilia pale fuscous, irrorated with darker, and sprinkled with whitish, with a white spot at anal angle, terminal half suffused with white. Hindwings with hindmargin rounded, white; a straight transverse fuscous median

streak; an irregular fuscous subterminal streak, angularly indented outwards in middle; a fuscous hindmarginal line; cilia white, somewhat sprinkled with pale fuscous, with a fuscous spot at anal angle.

Carnarvon, West Australia, in October; two specimens.

17. ACODIA, Ros.

Face with cone of scales. Palpi moderate, porrected, rough-scaled. Antennæ in ♂ bipectinated throughout. Posterior tibiæ with all spurs present. Forewings with veins 6 and 7 stalked or closely approximated from angle of cell, separate from 8, 8 out of 9, 10 and 11 out of 9, no areole. Hindwings with veins 6 and 7 stalked.

Includes the one species only. On first consideration the neurulation appears quite abnormal; in reality the origin of the veins is essentially as usual, but that portion of vein 9 which extends from 7 to the upper angle of the areole, thus forming the posterior margin of the areole, is absent through non-development. This structure is constant, and although it seems an unexpected form of modification, it occurs again (quite independently) in the European genus *Mesotype*, and as an abnormal individual variation (also quite independently) in *Hydriomena phaedra*, as noted above. Probably there is some unappreciated physiological reason for this tendency in this group; the three instances quoted have certainly no near genetic affinity. The present genus is undoubtedly a simple offshoot of *Xanthorhoë*.

76. *Acod. pauper*, Ros.

(*Acodia pauper*, Ros., Ann. Mag. N.H. 1885, 434, pl. xi, 7.)

♂♀. 25-31 mm. Head and thorax pale ochreous, sprinkled with dark fuscous, often suffused with dull reddish. Palpi 2½, dark fuscous, towards base whitish beneath. Antennæ dark fuscous spotted with whitish, pectinations in ♂ long (a 6, b 8). Forewings triangular, hindmargin waved, bowed, rather strongly oblique; pale ochreous, often more or less wholly suffused with

ochreous-reddish, with numerous regular waved fuscous or dark fuscous lines, more or less marked with blackish dots on veins; a small basal patch suffused with brown towards costa, its outer edge bent or curved near costa; median band sometimes suffused with brown or dull reddish, anterior edge from before $\frac{1}{2}$ of costa to $\frac{2}{3}$ of inner margin, curved, posterior edge from $\frac{2}{3}$ of costa to $\frac{1}{2}$ of inner margin, slightly bent or curved near costa, median third forming a short obtuse somewhat bidentate projection, always occupied by a cloudy dark grey spot; sometimes a whitish irroration beyond this; a blackish median discal dot; anterior margin of subterminal line indicated by a partial series of cloudy blackish-grey spots, most marked towards costa; a more or less marked oblique dark fuscous suffusion from apex, well-defined above; a hindmarginal series of black dots, connected by a fine line: cilia light ochreous or fuscous, sometimes reddish-tinged, faintly barred with darker. Hindwings with hindmargin strongly waved, rounded, colour, lines, discal and hindmarginal dots, and cilia as in forewings; median band with outer edge curved on upper half, without projection or darker spot.

Fernshaw, Victoria; Hobart, Tasmania; Perth and Albany, West Australia; from October to December, rather common.

18. XANTHORHOE, Hb.

Face with short cone of scales. Palpi moderate, porrected, rough-scaled. Antennæ in ♂ bipectinated, apex often filiform. Posterior tibiae with all spurs present. Forewings with areole double. Hindwings with veins 6 and 7 stalked.

A genus of considerable extent and general distribution, but everywhere less numerous than *Hydriomena*, except in New Zealand, where it is the more largely developed of the two.

- | | |
|--|--------------------------|
| 1. Hindwings clear orange | 87. <i>vicissata</i> . |
| Hindwings not clear orange | 2. |
| 2. Posterior margin of median band of fore-
wings straight | 88. <i>percrassata</i> . |

- Posterior margin of median band of forewings more or less projecting..... 3.
3. Abdomen with white basal band..... 84. *xerodes*.
Abdomen without white band 4.
4. Cilia sharply barred with dark fuscous and white 85. *epicrossa*.
Cilia not sharply barred 5.
5. Median band of forewings limited by clear white fasciæ..... 80. *argodesma*.
Median band of forewings not limited by white fasciæ..... 6.
6. Wings whitish-ochreous, with dull red lines 83. *anaspila*.
Wings not marked with red lines 7.
7. Median band of forewings limited by conspicuous white lines..... 86. *heliacaria*
Median band of forewings without clear white lines 8.
8. Hindwings without darker lines..... 89. *nephodes*.
Hindwings with darker lines..... 9.
9. Palpi $1\frac{1}{2}$ or less... 10.
Palpi 2 or more 11.
10. Forewings irrorated with white..... 81. *extensata*.
Forewings not irrorated with white 82. *repentinata*.
11. Antennal pectinations of ♂ very short (1)... 79. *vacuaria*.
Antennal pectinations of ♂ long (6-8) 12.
12. Forewings with dark oblique subapical suffusion 78. *subidaria*.
Forewings without dark subapical suffusion 77. *centroneura*.

77. *Xanth. centroneura*, n.sp.

♂. 30-33 mm. Head, thorax, and abdomen pale ochreous irrorated with dark fuscous, shoulders reddish-tinged, abdomen with a double dorsal series of dark fuscous dots. Palpi $2\frac{1}{2}$, pale

ochreous mixed with blackish. Antennæ dark fuscous, pectinations long (a 6, b 8), apical $\frac{1}{2}$ simple. Legs dark fuscous, irrorated and ringed with whitish-ochreous. Forewings triangular, hind-margin hardly waved, very slightly bowed, little oblique; light fuscous or brown-reddish, more or less densely irrorated with whitish-ochreous, with numerous very faint darker somewhat waved transverse lines, marked with conspicuous black dots on the ochreous-whitish veins between basal patch and median band, and between median band and subterminal line; basal patch limited by a curved dark fuscous line at $\frac{1}{6}$; median band limited anteriorly by two somewhat curved dark fuscous lines from before middle of costa to before middle of inner margin, suffused with blackish or reddish above middle and towards inner margin, posteriorly by three dark fuscous rather irregular lines from about $\frac{2}{3}$ of costa to $\frac{2}{3}$ of inner margin, suffused with blackish or reddish above middle, slightly projecting very obtusely in middle; included space nearly clear, with a moderate dark fuscous discal dot; subterminal line slender, waved, pale, preceded by a narrow darker suffusion; a hindmarginal series of blackish dots: cilia rather dark fuscous, mixed with ochreous and whitish, terminal half whitish-ochreous or pale reddish. Hindwings with hind-margin hardly waved, rounded; whitish-fuscous, posteriorly with faintly indicated waved darker lines; a median band of four somewhat stronger lines, rather bent above middle; hindmarginal dots and cilia as in forewings.

Mount Wellington, Tasmania, in February; two specimens received from Mr. G. F. Mathew, who found the species commonly there.

78. *Xanth. subidaria*, Gn.

(*Coremia subidaria*, Gn. X, 412; ?*C. cymaria*, ib. 415, *C. permissata*, Walk. 1317; *C. regulata*, ib. 1318; *C. relictata*, ib. 1318, *C. acutata*, ib. 1319; ?*Cidaria socialiata*, ib. 1410)

♂♀. 23-26 mm. Head and palpi brownish-ochreous or whitish-ochreous, mixed with reddish and dark fuscous; palpi in ♂ 2, in ♀ $2\frac{1}{4}$, base whitish. Antennæ grey, pectinations in ♂ long (a 6, b 8),

apical $\frac{1}{4}$ simple. Thorax pale ochreous, more or less suffused with reddish or rarely with fuscous, with two irregular blackish transverse bars. Abdomen whitish-ochreous irrorated with reddish and fuscous, with a double dorsal series of small blackish spots. Forewings triangular, hindmargin slightly waved, hardly bowed, rather oblique; pale ochreous or fuscous, often more or less wholly suffused with reddish, with numerous waved fuscous or blackish lines, varying in intensity; sometimes a more or less general whitish irroration; median band in ♂ moderate, in ♀ broader, formed by two groups of three lines each enclosing a clear space, both groups more or less suffused with dark fuscous or blackish, especially above middle, sometimes whole band suffused with dark fuscous, anterior edge slightly curved, posterior edge forming a short obtuse projection on median third, slightly sinuate above this; a black median discal dot; a pale waved subterminal line, often obscure; a triangular dark fuscous or reddish-fuscous suffusion on hindmargin beneath apex; a blackish hindmarginal line: cilia pale fuscous mixed with reddish and whitish-ochreous, with faint darker fuscous bars. Hindwings with hindmargin somewhat waved, rounded; pale fuscous, with numerous slightly curved obscure darker fuscous lines; posterior edge of median band somewhat unevenly curved and sinuate; hindmarginal line and cilia as in forewings.

var. (?) *urbana*. ♀. Forewings with median band and almost whole hindmarginal area suffused with blackish-grey, except upper half of pale fascia following median band, which therefore becomes conspicuous; median band broad, projection of posterior margin rather more prominent than in ♂. Hindwings suffused with rather dark grey.

Duaringa and Toowoomba (2000 feet), Queensland; Glen Innes (3500 feet), Newcastle, Sydney, and Mount Kosciusko (4700 feet), New South Wales; Melbourne and Fernshaw, Victoria; Mount Lofty, South Australia; Perth and Albany, West Australia; from August to January, and in April, usually very common everywhere. Whether the insect which I have called above var. *urbana*

belongs to this species or not, I cannot determine; at first sight it certainly looks distinct; I have five specimens, all from Sydney and quite similar, but except in the general dark suffusion there seems no tangible point of separation; I have no ♂ of this form, and its discovery may show that it is structurally distinct, and a good species: meanwhile, I prefer to regard it as a varietal form. The fact that I have taken no ♂, in a locality which I worked so long, is in favour of this view.

79. *Xanth. vacuaria*, Gn.

(*Coremia vacuaria*, Gn. X, 418.)

♂. 28 mm. Head, palpi, and thorax pale reddish-ochreous, mixed with dark fuscous; palpi 2. Antennae fuscous, pectinations very short (1), terminating in fascicles of cilia (2), apical $\frac{1}{2}$ simple. Forewings triangular, hindmargin rather waved, slightly bowed, oblique; pale ochreous, with cloudy reddish-ochreous waved transverse lines; basal patch marked with blackish lines, outer edge rather curved, with a few whitish scales, median band dark grey, marked with blackish lines, anterior margin from $\frac{1}{2}$ of costa to $\frac{2}{3}$ of inner margin, rather irregularly curved, posterior margin from $\frac{1}{4}$ of costa to $\frac{2}{3}$ of inner margin, edged by a fine whitish line, curved near costa, median third forming a moderate triangular round-pointed projection; a black median discal dot; subterminal line faintly whitish, waved; an interrupted black hindmarginal line: cilia whitish-ochreous suffused with pale rosy, with two obscure grey lines, barred with darker (partly imperfect). Hindwings with hindmargin waved, rounded; pale ochreous, on basal third sprinkled with grey; a median band of four grey lines, posterior angulated in middle; a blackish hindmarginal line, cilia pale ochreous, mixed with whitish and grey.

Hobart, Tasmania; Mount Lofty, South Australia; two specimens received from Mr. E. L. Guest. The short antennal pectinations are easily overlooked, as they were by Guénée, though his mention of the fasciculated ciliations proves that he had certainly this species before him, and not a *Hydriomena*; his description is also clear and good.

80. *Xanth. argodesma*, n.sp.

♀. 26 mm. Head, palpi, thorax, and abdomen dark fuscous, sprinkled with fuscous-whitish; palpi $1\frac{3}{4}$. Antennæ dark fuscous. Legs blackish, irrorated and ringed with white. Forewings triangular, hindmargin strongly waved, hardly bowed, oblique; grey, irrorated with whitish and blackish, with waved cloudy blackish lines; margins of median band more strongly marked with black, anterior from $\frac{2}{5}$ of costa to $\frac{2}{5}$ of inner margin, somewhat curved, preceded by a broad white fascia sprinkled with pale rosy and marked with blackish on costa and veins, posterior from $\frac{3}{4}$ of costa to $\frac{2}{3}$ of inner margin, with a slight projection beneath costa, and a short bidentate median projection, followed by a moderate white fascia, edged posteriorly with a pale rosy suffusion except towards costa, and a series of blackish dots on veins; a black transverse median discal dot; veins towards hindmargin marked with pale rosy; indications of an obscure whitish waved subterminal line; an obscure whitish oblique streak from apex, margined beneath by a blackish suffusion; an interrupted black hindmarginal line: cilia grey sprinkled with whitish, with two cloudy darker lines, obscurely barred with blackish-grey, base white. Hindwings with hindmargin deeply waved, rounded; grey, sprinkled with darker, with obscure waved darker lines, more blackish on inner margin; a curved obscure double line of whitish scales at $\frac{3}{4}$; hindmarginal line and cilia as in forewings.

Melbourne, Victoria; one specimen received from Mr. G. H. Raynor.

81. *Xanth. extensata*, Walk.

(*Larentia extensata*, Walk. 1195.)

♂♀. 23-25 mm. Head, thorax, and abdomen pale greyish-ochreous, irrorated with blackish and whitish. Palpi $1\frac{1}{2}$, blackish sprinkled with whitish. Antennæ grey, pectinations in ♂ long (*a* 6, *b* 7), continued to apex. Forewings triangular, hindmargin waved, bowed, oblique; grey, irrorated with white and dark grey, with numerous waved blackish-grey lines, in ♂ more blackish and alternating with whitish lines; median band in ♂ somewhat

darker, in ♀ much darker through absence of white irroration, anterior margin from $\frac{1}{3}$ of costa to $\frac{2}{3}$ of inner margin, rather curved, posterior from $\frac{3}{4}$ of costa to $\frac{2}{3}$ of inner margin, somewhat projecting beneath costa, with a short broad bidentate projection in middle; veins posteriorly sometimes ochreous-tinged; an interrupted black hindmarginal line: cilia grey mixed with white, with obscure dark grey bars. Hindwings with hindmargin waved, rounded; whitish-grey, irrorated with dark grey, forming cloudy waved transverse lines, in ♀ darker and more distinct, especially on median band, and more or less separated by whitish scales on posterior half; posterior margin of median band angulated in middle, indented below it; hindmarginal line and cilia as in forewings.

Bathurst (2500 feet), New South Wales; Melbourne, Victoria; Mount Lofty, South Australia; four specimens received from Mrs. Stephenson and Mr. E. L. Guest.

82. *Xanth. repentinata*, Walk.

(*Scotosia repentinata*, Walk. 1356; *S. incertata*, ib. 1356. *Tephrosia breviararia*, ib. Suppl. 1591.)

♂♀. 25-32 mm. Head, palpi, antennæ, thorax, and abdomen fuscous; a white spot behind eyes, palpi $1\frac{1}{2}$; antennæ with a white spot on basal joint, pectinations in ♂ long (a 7, b 8), continued to apex (?); thorax with two obscure darker transverse bars. Forewings triangular, hindmargin waved, bowed, rather oblique; fuscous, slightly reddish tinged, irrorated with darker, with obscure cloudy irregular waved darker lines; outer margin of basal patch indicated by a strongly curved darker line, sometimes followed by a few white scales; margins of median band marked in ♂ by blackish-fuscous suffused fasciæ, in ♀ by blackish-fuscous lines sometimes succeeded by some white scales, anterior from before $\frac{2}{3}$ of costa to $\frac{2}{3}$ of inner margin, rather strongly angulated above middle and indented below middle, posterior from $\frac{3}{4}$ of costa to $\frac{3}{4}$ of inner margin, irregular, rather projecting beneath costa, median third forming a moderate triangular almost acute projection; a rather large blackish fuscous transverse median discal

dot; subterminal line obscurely paler, waved; a dark fuscous hindmarginal line: cilia fuscous, faintly reddish-tinged. Hindwings with hindmargin almost dentate, rounded; light fuscous, slightly reddish-tinged, irrorated with darker, with cloudy waved darker fuscous lines; a transverse dark fuscous discal dot; posterior edge of median band somewhat darker, almost straight, in ♂ with slight central tooth; a subterminal series of pale dots; hindmarginal line and cilia as in forewings.

Dawson River, Queensland; Newcastle, Sydney, and Blackheath (3500 feet), New South Wales; from September to December, in March, May, and July, common.

83. *Xanth. anaspila*, n.sp.

♂♀. 23-27 mm. Head whitish-ochreous, lower half of face and a bar on forehead fuscous-red. Palpi $1\frac{1}{2}$, whitish-ochreous, irrorated with blackish. Antennæ fuscous-whitish, pectinations in ♂ rather short ($a\ 2\frac{1}{2}$, $b\ 3$), extreme apex simple. Thorax whitish-ochreous, patagia with two transverse lines of fuscous scales. Abdomen whitish-ochreous, extreme segmental margins white, preceded in ♂ by reddish, in ♀ by blackish transverse lines. Legs ochreous-whitish, anterior and middle tibiae suffused with light purplish, anterior and middle tarsi suffused with dark fuscous except apex of joints. Forewings somewhat elongate-triangular, apex slightly produced, hindmargin in ♂ entire, in ♀ faintly waved, bowed, oblique; whitish-ochreous, with numerous slender somewhat irregular dull red lines, angulated near costa; outer edge of basal patch indicated by two or three blackish dots; margins of median band indicated by series of blackish dots on veins, anterior from before middle of costa to $\frac{2}{5}$ of inner margin, angulated beneath costa, posterior from $\frac{3}{4}$ of costa to $\frac{2}{3}$ of inner margin, somewhat projecting beneath costa, slightly sinuate outwards in middle, where it is marked with a round dull red spot containing two small confluent blackish spots; subterminal line faintly whitish, not waved; veins partially marked with blackish towards hindmargin, especially two above middle, which are

surrounded with a dull red suffusion; a fine black interrupted hindmarginal line: cilia whitish-ochreous, basal half mixed with light reddish, and with some dark grey scales indicating obscure bars. Hindwings with hindmargin somewhat waved, rounded, upper half sinuate inwards; whitish-ochreous, with cloudy dull red nearly straight lines, somewhat bent near costa; posterior margin of median band twice slightly sinuate, marked with black dots; subterminal line faintly whitish, preceded by two more strongly marked lines; hindmarginal line and cilia as in forewings.

Glen Innes (3500 feet) and Sydney, New South Wales; in November and December, two specimens. This species has so much general resemblance to some *Boarmiulæ*, that it is difficult not to infer intentional mimicry.

84. *Xanth. xerodes*, n.sp.

♂♀. 22-24 mm. Head and thorax grey irrorated with whitish and black, thorax with two ill-defined black transverse bars. Palpi $2\frac{1}{2}$, blackish, base whitish. Antennæ dark grey, pectinations in ♂ moderate ($a\ 3, b\ 3\frac{1}{2}$), continued to apex. Abdomen grey, irrorated with blackish and whitish, with a double dorsal series of small black spots, basal segment with a white band. Legs blackish, irrorated and ringed with white. Forewings triangular, apex slightly prominent, hindmargin waved, bowed, oblique; grey, sprinkled with white, with numerous irregular waved blackish lines; veins sometimes partially marked with ferruginous; basal patch slightly darker, outer edge curved; space between this and median band sometimes suffused with reddish-ochreous; median band slightly darker, margins sometimes partially suffused with black above middle, anterior margin from $\frac{2}{3}$ of costa to $\frac{2}{3}$ of inner margin, curved, posterior from $\frac{1}{4}$ of costa to $\frac{3}{4}$ of inner margin, slightly projecting beneath costa, median third forming a short tolerably acute projection; a transverse black median discal dot, sometimes ringed with whitish; sometimes a light reddish-ochreous fuscia beyond median band, marked with black and white on veins; subterminal line waved, whitish; an interrupted black hindmarginal line: cilia rather dark fuscous, with basal, median, and

apical whitish lines, obscurely barred with darker. Hindwings with hindmargin waved, more deeply in ♀, rounded; fuscous-grey, sprinkled with darker, with faint darker lines, becoming more distinct towards inner margin posteriorly; hindmarginal line and cilia as in forewings.

Perth and Albany, West Australia; in October and November, five specimens. It has considerable superficial resemblance in some instances to *Hydr. severata*, but is much more variable; the likeness is probably analogical only.

85. *Xanth. epicrossa*, n.sp.

♂♀. 22-26 mm. Head and thorax fuscous sprinkled with white, thorax with two dark fuscous transverse bands. Palpi $2\frac{3}{4}$, dark fuscous, base white. Antennæ rather dark fuscous, stalk sprinkled with white, pectinations in ♂ rather long (*a* 5, *b* 6), continued to apex. Abdomen fuscous, mixed with blackish-fuscous and white. Legs dark fuscous, sprinkled with whitish, apex of joints white. Forewings triangular, in ♀ more elongate, hindmargin waved, rounded, oblique; light brownish-ochreous, with somewhat irregular well-marked dark fuscous lines; a few scattered white scales, especially towards costa; a curved white line rather near base; median band limited by well-defined white lines, anterior from $\frac{2}{3}$ of costa to $\frac{1}{3}$ of inner margin, curved, slightly dentate near costa, posterior from $\frac{3}{4}$ of costa to $\frac{2}{3}$ of inner margin, somewhat projecting near costa, median third moderately sinuate outwards; between these are sometimes traces of an incomplete whitish median line; subterminal line formed by a series of white spots, twice sinuate; an interrupted blackish hindmarginal line: cilia white, with a fuscous line, and sharply barred with rather dark fuscous. Hindwings rather elongate, hindmargin waved, rounded; light fuscous, somewhat ochreous-tinged, with cloudy suffused darker fuscous lines; posterior margin of median band somewhat marked with whitish, sinuate; subterminal line somewhat whitish, twice sinuate; hindmarginal line and cilia as in forewings.

Blackheath (3500 feet) and Mount Kosciusko (5000-5700 feet), New South Wales; Deloraine, Tasmania; from December to February, locally common.

86. *Xanth. heliacaria*, Gn.

(*Coremia heliacaria*, Gn. X, 420.)

♂. 26 mm. Head and thorax rather dark fuscous, mixed with pale ochreous. Palpi $2\frac{1}{2}$, dark fuscous mixed with whitish-ochreous. Antennæ rather dark fuscous, pectinations rather long (*a* 5, *b* 6), continued to apex. Abdomen rather dark fuscous, irrorated with whitish-ochreous. Forewings triangular, hindmargin waved, rounded, oblique; dark fuscous, mixed with pale yellowish-ochreous except towards hindmargin; base sprinkled with whitish; a whitish line at $\frac{1}{4}$, bent near costa; median band limited by well-marked white lines, anterior from $\frac{2}{3}$ of costa to before middle of inner margin, somewhat curved near costa, sinuate near inner margin, posterior from $\frac{1}{4}$ of costa to $\frac{3}{4}$ of inner margin, median third forming a moderate rectangular projection, indented above and below this, a transverse black median discal dot between these, and traces of a straight whitish median line; subterminal line slender, white, somewhat irregular. cilia fuscous, sprinkled with whitish, forming faint bars. Hindwings with hindmargin waved, rounded; orange-yellowish, wholly irrorated with fuscous; a moderate dark fuscous hindmarginal band, cut by a cloudy orange yellowish subterminal line; cilia as in forewings.

Mount Lofty, South Australia; one specimen received from Mr. E. L. Guest. According to Guénée the species occurs also in Tasmania, and the ♀ is similar.

87. *Xanth. vicissata*, Gn.

(*Coremia vicissata*, Gn. X, 421, pl. ix, 5.)

♂♀. 28-34 mm. Head and thorax dark fuscous, mixed with pale ochreous and sometimes with reddish. Palpi in ♂ 2, in ♀ $2\frac{1}{2}$, whitish ochreous, mixed with dark fuscous. Antennæ dark fuscous, obscurely spotted with paler, pectinations in ♂ moderate

(*a* 3, *b* 4), extreme apex simple. Abdomen whitish-fuscous irrorated with dark fuscous, sides suffused with yellowish. Forewings triangular, hindmargin waved, somewhat bowed, rather oblique; fuscous, more or less suffused with ochreous or reddish, with numerous irregular waved blackish lines; a slightly curved obscure ochreous-whitish line about $\frac{1}{5}$; median band more or less mixed with whitish-ochreous towards costa, limited anteriorly by a slightly curved double ochreous-white line from $\frac{2}{5}$ of costa to $\frac{2}{5}$ of inner margin, slightly angulated above and below middle, posteriorly by a straight slightly irregular-edged ochreous-white fascia from $\frac{3}{4}$ of costa to $\frac{3}{4}$ of inner margin; a moderate transverse black median discal dot; subterminal line whitish, strongly waved, sometimes partially obscure; a short oblique whitish apical mark; an interrupted black hindmarginal line: cilia fuscous, extreme base whitish, with median and apical obscure rosy-whitish lines, and faint darker bars. Hindwings with hindmargin waved, rounded; orange; some short dark fuscous marks from inner margin on posterior half; a narrow dark fuscous suffusion extending from anal angle along hindmargin in ♀ to near middle, in ♂ to beyond middle, with traces of a whitish subterminal line at lower extremity; hindmarginal line and cilia as in forewings, cilia round apex suffused with yellowish.

Bathurst (2500 feet), New South Wales; Melbourne, Victoria; Hobart, Tasmania; Mount Lofty, South Australia; five specimens received from Messrs. G. H. Raynor and E. L. Guest.

88. *Xanth. percrassata*, Walk.

(*Catopyrrha percrassata*, Walk. 1065.)

♂♀. 31-32 mm. Head, palpi, and thorax fuscous, mixed with whitish-ochreous; palpi 2. Antennæ fuscous, pectinations in ♂ short (1), terminating in tufts of cilia (2), apical $\frac{1}{2}$ simple. Forewings triangular, hindmargin hardly bowed, waved, rather oblique; fuscous, slightly ochreous-tinged, sprinkled with dark fuscous and white; an obscure whitish line towards base, shortly angulated near costa; median band formed by two dark fuscous fasciæ

(posterior broader) enclosing a fascia of groundcolour, in which is a black discal dot, equally broad throughout, anterior edge limited by a nearly straight sometimes double whitish line from $\frac{2}{5}$ of costa to $\frac{1}{4}$ of inner margin, very shortly angulated beneath costa, posterior edge limited by a nearly straight band of two moderate whitish lines from beyond $\frac{1}{4}$ of costa to $\frac{1}{4}$ of inner margin; subterminal line whitish, well-marked, entire, almost straight, preceded by a narrow dark fuscous fascia; a very small white oblique apical dash; a black hindmarginal line: cilia fuscous, sprinkled with whitish, and with a fine whitish median line. Hindwings with hindmargin rounded, rather strongly waved; pale fuscous, slightly ochreous-tinged, sprinkled with darker, forming faint transverse lines; a paler nearly straight or slightly bent postmedian, and curved subterminal line, both (especially latter) preceded by darker shades; hindmarginal line and cilia as in forewings.

Melbourne, Victoria; three specimens received from Mr. G. H. Raynor and Dr. Lucas.

89. *Xanth. nephodes*, n.sp

♂. 37 mm. Head fuscous, mixed with fuscous-whitish, face darker fuscous. Palpi 2, whitish mixed with dark fuscous. Antennae dark grey, pectinations rather long (a 6, b 7), extreme apex simple. Thorax light ochreous-fuscous, with a few whitish scales. Abdomen fuscous sprinkled with whitish. Legs fuscous. Forewings elongate-triangular, hindmargin slightly waved, bowed, oblique; thinly scaled, rather light fuscous, with a few whitish scales, and sprinkled with whitish-ochreous along costa; faint indications of two lines of dark fuscous irroration about $\frac{1}{5}$; median band limited by two obscure cloudy lines of dark fuscous irroration, anterior from $\frac{2}{5}$ of costa to $\frac{2}{5}$ of inner margin, slightly curved, posterior from $\frac{1}{4}$ of costa to $\frac{1}{4}$ of inner margin, median third forming a short angular projection; a cloudy dark fuscous median discal dot: cilia rather light fuscous. Hindwings elongate, hindmargin hardly waved, rounded; pale fuscous, thinly scaled, cilia pale fuscous.

Mount Kosciusko (6500 feet), New South Wales, in January ; one specimen. This is a curious species, very different from any of the above, but having many points of resemblance to the New Zealand *X. nephelias*, to which it is probably allied.

19. DASYURIS, Gn.

Face rough-haired or with cone of scales. Palpi moderate, porrected, with long dense rough hairs. Antennæ in ♂ ciliated. Thorax and coxæ hairy beneath. Posterior tibiæ with all spurs present. Forewings with areole double. Hindwings with veins 6 and 7 stalked.

At present only known elsewhere from New Zealand, where there are several species.

Hindwings with yellow markings..... 91. *euclidiata*.

Hindwings without yellow markings 90. *decisaria*.

90. *Das. decisaria*, Walk.

(*Fidonia decisaria*, Walk. 1671.)

♂. 21-22 mm. Head, palpi, and thorax blackish, mixed with white and ochreous-yellowish ; palpi $2\frac{3}{4}$. Antennæ dark grey. Abdomen blackish, irrorated with white. Forewings somewhat elongate-triangular, hindmargin hardly waved, rounded, oblique ; fuscous, irregularly irrorated with white and pale ferruginous, with obscure cloudy waved darker fuscous lines ; a rather curved more blackish line at $\frac{1}{3}$; median band limited by stronger lines marked with black and edged anteriorly with whitish, anterior from $\frac{2}{5}$ of costa to $\frac{2}{5}$ of inner margin, curved, posterior from $\frac{2}{5}$ of costa to $\frac{3}{4}$ of inner margin, somewhat bent beneath costa, median third forming a moderate subacute projection ; a black median discal dot ; subterminal line whitish, waved, only distinct towards costa, where it is preceded by a dark fuscous suffusion : cilia fuscous, mixed with blackish, and barred with white. Hindwings with hindmargin slightly waved, rounded ; rather dark grey, with faint cloudy lines formed by whitish irroration ; a distinct whitish postmedian line, edged with darker grey anteriorly, obtusely angulated in middle ; cilia as in forewings.

Mount Wellington (3300 feet), Tasmania, in December ; three specimens.

91. *Das. euclidiata*, Gn.

(*Coremia euclidiata*, Gn. X, 420 ; *C. glyphicata*, ib. 420.)

♂. 18-20 mm. Head, palpi, and thorax pale ochreous, mixed with white and with a few black scales ; palpi 3. Antennæ whitish, spotted with dark grey, filiform, ciliations $\frac{1}{2}$. Forewings elongate-triangular, hindmargin hardly waved, bowed, oblique ; pale brownish-ochreous, mixed with white in disc, and irrorated with black, forming cloudy rather irregular lines ; a curved white line about $\frac{1}{4}$; median band limited by well-marked white lines, edged internally more strongly with black, anterior from beyond $\frac{1}{2}$ of costa to $\frac{2}{3}$ of inner margin, gently curved, posterior from $\frac{2}{3}$ of costa to $\frac{3}{4}$ of inner margin, slightly sinuate, median third forming a moderately strong tolerably acute projection ; a black median discal dot, a whitish subterminal line, not waved, preceded by a darker suffusion, a short oblique whitish apical dash ; an interrupted black hindmarginal line : cilia rather dark grey, terminal $\frac{1}{2}$ barred with white. Hindwings with hindmargin hardly waved, rounded ; ochreous-yellow ; basal third mostly suffused with dark fuscous, limited by a straight line ; a cloudy dark fuscous fascia from before middle of costa to $\frac{3}{4}$ of inner margin, outer edge forming a triangular projection in middle, followed by a faint whitish line ; a parallel dark grey line near beyond this, interrupted in middle, a moderate dark fuscous hindmarginal band, anterior edge rectangularly indented in middle, including a whitish subterminal line ; a hindmarginal series of yellowish dots ; cilia as in forewings.

Melbourne and Mount Macedon, Victoria ; two specimens received from Mr. G. H. Raynor. My previous identification of this species with the New Zealand *catapyrrha*, Butl., I now find to be erroneous, the two insects being structurally and in fact generically distinct, although superficially extremely similar. According to Guénée the ♀ of this species resembles the ♂.

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Note.—Certain species of Guénée I fail to recognise ; they are possibly good species not possessed by me. These are *Coremia extraneata*, Gn. X, 416, *C. opertaria*, ib. 421, *Camplogramma bichromata*, ib. 425, and *C. cheimatobiata*, ib. 428. I believe *Melanippe icterata*, Gn. X, 387, pl. ix, 9, to be wrongly ascribed to Australia.

NOTES ON THE NIDIFICATION OF THE TORRES STRAITS PIGEON, *MYRISTICIVORA SPILORRHOA*.

BY A. J. NORTH, F.L.S.

From the month of October until the end of March the Torres Straits or White Nutmeg Pigeon, during most seasons, is freely dispersed over the dense brushes and mangrove-lined mouths of the rivers of the North-eastern coast of Queensland. Mr. J. A. Boyd, of the Herbert River, has kindly forwarded me the eggs of this species taken on North Barnard Island by Captain Procter at the latter end of last season, also the accompanying notes kindly communicated by Mr. Wm. T. White, of Greenfield, relative to the nidification of this fine pigeon.

"A few years ago these birds came to the scrubs on the Herbert River in great numbers, generally arriving about the beginning of September and remaining until the end of March, but during the last three or four years they have become very scarce, in fact, I did not see a score altogether last year. The decrease in their numbers is no doubt due to the wholesale slaughter of these poor birds during the breeding season, and, unless this is prevented, the Torres Straits pigeons will entirely disappear from this district within the next four or five years. I have found the eggs of these birds during November and December. The nest is a very rude structure, consisting simply of a few twigs laid across each other in the fork of a horizontal branch generally not more than fifteen or twenty feet from the ground, and so open that the eggs (two in number) are visible from below. The birds appear to prefer mangroves and tea-trees, and do not crowd their nests together, although three or four pairs may sometimes build in the same tree. I have frequently found their nests fully twenty miles inland, but think most of them build very close to the sea."

Mr. Boyd also informs me that they breed sometimes in the open forest Eucalypti, and that he has obtained very young pigeons miles from the coast. Last year he did not observe any pigeons till after Christmas, but obtained two specimens this season on the 14th of September, and has since seen several small flocks. Mr. Boyd is of opinion that the cause of the pigeons not frequenting the Herbert River district so much as formerly is due to the felling of hundreds of acres of scrub that contained the berry-bearing trees on which they fed.

It is worthy of note that the nests of *Myristicivora spilorrhoea*, found by Captain Proctor, Mr. W. T. White, and the late Mr. John Macgillivray, each contained two eggs for a full sitting, while those found by Gilbert at Port Essington either contained a single egg or a single young bird.

The eggs vary in shape from an ellipse to an elongated oval, are pure white, the texture of the shell being fine, one specimen being lustreless, the other slightly glossy. Length (A) 1.8×1.3 inch; (B) 1.83×1.2 inch.

It may not be out of place to mention here that migratorial birds are in some seasons more abundant in the localities they usually visit than in others, which is not always due to climatic influences or an abundance of food. The Top-knot Pigeons (*Lopholaimus antarcticus*), especially, have been very numerous this season in New South Wales, my attention first being drawn to the fact by the unusually large number of these pigeons that were exposed for sale in the poulterers' shops about Sydney during July and August.

On the 9th of August some notes were contributed to the 'Sydney Mail,' referring to the unusual number of Top-knot Pigeons which were on the brushes at that time in the neighbourhood of Gosford, several of which had made nests and laid their eggs. Mr. W. J. Grime also informs me that "the Top-knot Pigeons were particularly plentiful this season in the neighbourhood of the Tweed River, and that flocks of them, numbering

some thousands, could be seen during September flying round at any time through the day from the mountains to the coast, and back." Mr. Boyd writes, "The Top-knot Pigeons have been very plentiful this season; they have not been so numerous since 1882."

This season has not been a better one than the last for the berry-bearing trees that provide the food for these pigeons, yet in both colonies has the Top-knot Pigeon been more than usually abundant this year.

ON THE NATURALISED FORMS OF LAND AND
FRESH-WATER MOLLUSCA IN AUSTRALIA.

BY CHAS. T. MUSSON, F.L.S.

Having been fortunate enough during the past year to get together examples of several imported slugs, it may prove of some interest to give a short account of the same, as well as of some shell-bearing forms that have also found their way to these southern climes.

Colonization of mollusca has been, along with the distribution of other organisms, constantly going on. We cannot claim for our molluscan friends, however, that they have themselves acted other than passively in the matter, except in cases where self-preservation may cause certain efforts to be put forth for a certain purpose; every instinct then asserts itself, no doubt, endeavouring to preserve *that* life, which is dear even to the crawling snail.

A long paper might be written upon those methods in nature, either detected or suspected, through which the land and fresh-water mollusca are or may be distributed.

In these few remarks I do not wish to call special attention to the diverse ways in which this might be effected, or the means by which we have received what are most popularly known as intolerable garden pests.

No doubt, in the case of most of the species now to be considered, the agency of man has, either designedly or involuntarily, been the means by which our imported snails came to take up their residence in Australasia.

Man has, in time past, for food purposes, and acting with forethought, in different countries exported and imported snails;

as in the case of *Helix pomatia*, L., the Apple snail (somewhat of the appearance of our *H. pachystyla*), which was taken to Britain by the Romans and reared in large numbers. Many thousand tons of so-called shell-fish are used per annum as food, in Europe alone, land forms amongst them.

A case amongst fresh-water shells may also be quoted, in this instance brought about involuntarily.

Planorbis dilatatus, Gould, an American form, was recorded about 1870 from canals at Manchester, believed to have been introduced with cotton.

Again, the accidental importation of *Dreissena polymorpha*, Pallas, the Zebra mussel, probably with timber from the Baltic, proved in a few years as great a pest in one way as the Canadian water weed did in another.

The forms now found, some of them in abundance, throughout Australasia are, with one exception, from Western Europe. They are as follows :—

FRESH WATER UNIVALVES :—*Limnaea peregra*, Muller, *L. stagnalis*, Linné ; *Planorbis spirorbis*, Muller (?) ; *Neritina fluvio-tilis*, Linné.

NAKED MOLLUSCA OR SLUGS :—*Arion ater*, Linne, *A. hortensis*, Fér. ; *A. fuscus*, Muller ; *Amalia gurgates*, Drap. ; *Limax agrestis*, Linné, *L. flavus*, Linne ; *L. maximus*, Linne.

SHELL-BEARING MOLLUSCA OR SNAILS :—*Zonites cellarius*, Mull. ; *Z. nitidus*, Mull ; *Helix aspersa*, Mull, *H. nemoralis*, Linne. *H. cuperata*, Mont. ; *H. pulchella*, Mull. ; *H. virgata*, Da Costa (!) . *Bulinus acutus*, Mull. , together with *Helix sinularis*, Fer., a widely diffused southern species not found in Europe.

These make up a most interesting list

It should be noted that two of the species are very doubtfully Australian, viz., *P. spirorbis* and *H. virgata*. The fact that examples of these two species are in the British Museum labelled Australian is insufficient evidence. The former species is from

of about thirty years from the original date of supposed collection. We cannot admit either species to a permanent position in our records without corroborative evidence.

Another species, a *Planorbis*, found near Melbourne, stated to be introduced, is, Mr. Brazier informs me, an indigenous *Segmentina*.

Another European species of slug is found with us, viz., *Limax lævis*, Müll., (syn. *L. Queenslandicus*, C. Hedley, P.R.S.Qld., 1888; *L. Rarotonganus*, Heyneman), an exceedingly glossy form about $\frac{3}{4}$ of an inch long. Recorded from Queensland, N.S.W., Victoria, and New Zealand; very widely distributed. We may, I think, consider this an indigenous form. It is found in very out of the way places, and far away from the coastal cities in such situations that we can but consider it as indigenous. Mr. Hedley is quite of this opinion, and I am disposed to agree with him.

Godwin-Austen describes a *Helicarion* under the specific name of *Helenæ* from Sydney; it is a synonym of *H. hyalinus*. Mr. Brazier states that the examples obtained by Godwin-Austen were from a colony introduced from Queensland.

We may note that Professor Hutton describes a *Testacella* (species *vagans*) from gardens in the vicinity of Auckland, N.Z., a carnivorous slug-like mollusc carrying a small ear-shaped shell on its tail. Representatives of this genus usually live in gardens, under the surface of the ground. There are three distinct British forms. Mr. Cheeseman of the Auckland Museum thinks their species may prove to be one of the European forms, possibly *T. maugei*, Fér.

A species of slug has been described by Gould (Otia Conch.) from Parramatta, as *Limax olivaceus*. The length is given as $\frac{2}{3}$ inch; Tryon, however, (Man. Conch. Vol. I.) gives 2.5 inches as the size, and figures (pl. 50, f. 81) a slug corresponding with the size given. If the latter be correct it is probably a form of *L. flavus*, L.; whilst if Gould's measurement be correct, it is probably *L. lævis*. The latter form, it may be noted, is found in the original locality. Tate (in P.R.S. Tasmania, 1880) has also

described three species of S. Australian and Tasmanian slugs. It would be interesting to see examples of all these forms, as one cannot but feel somewhat suspicious as to their claim to be indigenous. They may prove to be merely introduced. Another species, *Milax antipodum*, has been described from New Zealand by Pfeiffer; whilst Gould has described *Limax fuliginosus* from the same colony. Tate suggests that these two may prove to be specifically identical; they might also be European. Hutton also describes from New Zealand *Milax emarginatus*, (Trans. N.Z. Inst. XI., p. 331).

Another slug, unknown to us here, has been described by Selenka, *Limax pectinatus* (in Malak. Blatt. XII. p. 105, pl. 2, figs. 1-9); it is probably *L. gagates*. It is a pity when Australian forms happen to be described abroad, that typical examples are not forwarded to the country from whence they came.

Quoy and Gaimard described (Zoology of Freycinet's Voyage in the Uranie, 1821, pp. 426, 427) two slugs from Port Jackson under the names of *Limax megalodontes* and *L. maurus*. From the very meagre descriptions, and absence of figures, it is impossible to say exactly what these are; possibly they may have been introduced forms the former perhaps *Limax flavus*, and the latter *Amalia gagates*.

It is interesting to note that the tide, so far as evidence from a consideration of our molluscan connections with Europe goes, is one of emigration from North to South, of hardy temperate forms to warmer regions, following out an old established rule.

Legrand says (P.R.S. Tas. 1870), that *Helix Morti*, Cox, which is found near Hobart, has probably been introduced from N.S.W., in mould with plants. Cox also records *H. cyclostomata*, Le Guill., as received from Melbourne; it is a native of Queensland.

It is a curious fact, that some of the British species included in the above list are not by any means the commonest forms in that country; whilst some of the commoner forms *there* have not as yet reached *us*; amongst them it may be observed, that *Helix hispida* and *H. rufescens*, as yet unknown here, have made themselves at home in the United States.

It can be said, also, that those species possessing special facilities for distribution ; namely, in being on the whole plentiful, and inhabiting such situations (cellars, gardens, proximity to sea, grass fields, &c.), as would put them in the way of having chances of emigration forced upon them, have been the fortunate ones, if we may so term it.

Certain other fresh-water forms one might also expect to see that do not exist here. It would not be surprising to find that European forms of *Ancylus*, *Pisidium*, *Sphaerium*, or *Planorbis* are identical with some of our so-called indigenous forms ; or may find their way here in time.

Doubtless some forms are better fitted by constitution or otherwise for emigration, and the better able to adapt themselves to circumstances, temperate forms being particularly favoured in this respect.

We should particularly notice the fact that our N.S.W. form of *H. aspersa*, so far as my observation goes (and Mr. Hedley confirms it), is smaller and thinner than the type, and may be considered the variety *tenuior*, whilst var. *conoidea* is often seen in New Zealand. The former small, very thin, transparent, reddish, often without bands ; the latter thin, small, and conical. It is a very variable shell. The exceptional thinness of our form might be set down to want of lime in the soil, scarcity of, or difference in, food. This does not, however, necessarily always appear to be the case : on sandy soils on New Red Sandstone in the Midland Counties of England this species attains normal size and thickness. Mr. Carson informs us that shells found in the Melbourne botanical gardens are much larger and thicker than our Sydney form. Of course the curious point is whether the variety *tenuior* has been introduced here, or whether it has arisen by reason of changed circumstances, from the introduced typical form.

May it not be probable that the change to our warm and equitable climate is one cause, enabling the animal to do with a thinner protective shell than in colder England? (In S. Europe there is an attenuated form, *H. aperta*, allied to its larger congener.)

Whilst the absence of their natural enemies in the shape of Black-birds, Thrushes, and such like may be another cause helping to produce the effect above-mentioned, inasmuch as the absence of hereditary enemies might in time deaden somewhat those instincts in the animal which cause it to be on the alert for danger. In other words—Given no present necessity for a thick shell as a protection against enemies or cold, together with constant changed environment and altered circumstances (food, climate, times, and seasons, &c.), differing altogether from the ancestral experiences (I mean the relations of the ancestral type form to its environment), we can, I think, quite conceive that there may be sufficient causes operating to bring about such an effect as we see in the thin shells of *H. aspersa*, even after only a few short generations.

Binney in his "Land Shells of the United States," points out that *Helix hortensis*, a common European banded snail (only recorded with us from N.Z.), has been transplanted to some of the small islands on the east coast of the United States in the vicinity of Cape Ann, occurring there in countless numbers. It is worthy of notice that each island is inhabited by a variety peculiar to itself, showing that the variety which happened to be introduced there has propagated itself without a tendency to run into other varieties.

It will be noticed that we have as yet very few records of the imported species, absolutely none for some of the colonies. It would be worth while for those interested in the subject to help in extending our knowledge by collecting and preserving examples of these neglected forms for the purpose of identification and the completion of a comprehensive series of records. The best plan for preservation is to drown the animal in water before placing in spirits.

Good figures of the Slugs may be found in *Zeitschrift für wissenschaftliche Zoologie*, 1885, plate VII., with an article on the European species by Dr Sinuoth, whilst full lists of synonyms may be obtained from Lovell Reeve's "British Mollusks" and other works.

My thanks are due to Messrs. Brazier and Hedley for information on this subject, freely and kindly given. It is to hoped that these few remarks, together with a list of Australasian records (so far as known) appended below, will cause a little more attention to be paid to our introduced forms of Mollusca, which, although often found to be arrant pests, are like ourselves, making a new home in a country to which their forefathers were strangers.

List of the Naturalised Land and Fresh-water Mollusca found in Australasia.

LIMNÆA PEREGRINA, Müller, 1773.

L. Hobartensis, T.-Woods, P.R.S. Tas. 1875.

An abundant species, ranging throughout Europe, to Siberia, Thibet and Afghanistan. Inhabits sluggish streams, ponds and ditches; as a rule not so large in fast-running water, but cleaner and more elegant. A great wanderer.

Tasmania: neighbourhood of Hobart (T.-Woods and W. F. Petterd).

LIMNÆA STAGNALIS, Linné, 1758.

L. Tasmanica, T.-Woods, P.R.S. Tas. 1875.

Common in Europe; also found in Siberia and Cashmere.

Inhabits stagnant water usually.

Frequently found floating shell downwards on the surface of water; a favourite habit also of *L. peregrina*, and species of the *Bulinus* family.

New Zealand; Auckland, at the Onehunga Springs; Christchurch, in the River Avon, said to have been introduced intentionally as food for trout.

Tasmania: Hobart (T.-Woods).

Examples of this form in the Melbourne Museum appear to belong to the variety *fragilis*.

PLANORBIS SPIROBIS, Müller, 1774.

In stagnant water and sluggish streams in every part of Gt. Britain.

Mr. E. A. Smith in his list of Aus. F.-W. Shells (Journ. Linn. Soc. Zool. 1881) states there are two tablets of this species in the British Museum, originally from the Cuming collection, and labelled North Australia.

As this species has not been seen in any of the colonies, so far as I am aware, we can hardly properly include it in the Australian fauna without some confirmatory evidence.

NERITINA FLUVIATILIS, Linné, 1758.

Ranging from Finmark to Sicily ; found on stones and walls in canals and rivers.

New Zealand : reported from the Waikare river (Kirk).

ARION ATER, Linné, 1758.

Very variable ; commonly called the black slug. Black, chocolate, red, yellow or greenish, sometimes whitish, coarsely tubercled, foot usually yellowish ; shell consisting of granules only, internal, back not keeled. From 3 to 5 inches long.

Ranging from Siberia to Corsica. Introduced into United States. Commonly found in woods, fields and gardens in moist places, about wells and pumps.

New Zealand : Dunedin (Hutton) ; Auckland, crawling over the roads after rain (Musson).

ARION FUSCUS, Muller, 1774.

Arion incommotus, Hutton, Trans. N.Z. Inst., XI., p. 331.

An inhabitant of N.W. Europe.

New Zealand : Dunedin (Hutton)

ARION HORTENSIS, Müller, 1774.

A small slug, varying in colour from black to brown, rufous, yellowish, grey, or greenish, usually striped longitudinally, tubercled, foot lighter than back, not keeled, shell internal, and consisting of granules only. About $1\frac{1}{2}$ inches long.

Of European origin, ranging from Siberia to Corsica. It has made its way to North America. Found in fields and damp places, under logs and stones

New Zealand : Auckland, plentiful ; crawling about the roads after rain (Musson).

This species, with *Arion ater*, appears to affect cool climates ; they have not yet been heard of as inhabiting Australia.

AMALIA GAGATES, Drap., 1801.

A very variable slug : black, slate colour, dark red, brown or yellowish, with dusky markings, pale underneath, acutely keeled from mantle to tail, shell internal. A small calcareous plate. From $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long.

Common in S. Europe, scarce in England ; inhabits hedgerows and gardens amongst vegetable matter. Also found in many parts of the world.

New Zealand : Ohaupo and Auckland (Musson).

New South Wales : Tamworth (Musson) ; Sydney, under stones at Darling Point, in company with *L. agrestis* (G. Neville) ; Gladesville (H. Deane) ; abundant near Sydney (Brazier).

Victoria : Ballarat, under garden rubbish, stones and wood, also on cabbages, coming out at night and in the early morning (Musson).

LIMAX AGRESTIS, Linné, 1758.

L. molestus, Hutton, Trans. N.Z. Inst., XI. p. 331.

A common slug, usually ash-grey, rufous, yellowish, cream colour or whitish, often mottled ; with a short keel at the tail ; shell internal, consisting of a calcareous plate such as all the Limaces have. From $1\frac{1}{2}$ to 2 inches long.

Found in gardens, fields, hedgerows, under stones and wood, throughout Europe. Also in the maritime cities of the United States. Very destructive to garden produce ; sometimes called the cabbage or white slug, and eaten as a cure for diseases of the chest.

New Zealand : Auckland, Wellington, Nelson, Greymouth, Christchurch, Dunedin, &c. (Hutton).

N.S.W. : Under stones at Darling Point (G. Neville) ; Tamworth (Musson).

Victoria : Melbourne (Kershaw).

LIMAX MAXIMUS, Linné, 1758.

A large slug; colour varying from ash to yellowish-grey or sometimes black; often streaked or spotted with white or black; much wrinkled. From 4 to 6 inches long.

Abundant in Europe from Finland to Corsica, Madeira and Syria. Introduced into North America. Found in damp retired and shady situations.

New Zealand: Dunedin (Hutton).

N.S.W.: common in and around Sydney (Brazier).

Victoria: Ballarat, under logs in the bush five miles from city (Musson).

Tasmania: gardens and cellars at Hobart (Tate), and Launceston (Hedley).

Mr. Brazier showed me an example of this species found at Summerhill near Sydney, by Mr. R. J. Etheridge: pale grey with black spots, evidently the European var *maculata*. It approaches somewhat *L. psarus*, Bourg., from Lombardy, as figured in Tryon's Manual, (pl. 46, fig. 37), but the spots have no tendency to run into lines.

Mr. Hedley informs me that examples of *L. maximus*, obtained in Mr. Petterd's garden at Launceston, are infested with an *Acarus*, possibly the same as found under similar circumstances in England. (*L. flavus* also suffers in the same way.) An interesting fact. The question is, did the host when fully grown bring out its parasite from original home, or has the slug, since coming out of the egg here, contracted the habit of giving house room to its uncongenial neighbour. An investigation of this question might throw some light on the manner in which our imported slugs (and their ally) have found their way here.

LIMAX FLAVUS, Linné, 1758.

Limax variegatus, Drap.; *Limax Breckworthianus*, Heynemann, recorded from Sydney, Malak. Blatt. XIV. pp. 131-133; *L. bicolor*, Selenka, Ibid., XII. pp. 105, 173, XVI. 50.

A yellowish slug, tessellated with white and black, or dark brown, coarsely tuberculate, very variable as are all these

creatures ; keeled towards the tail, which is pointed. From $2\frac{1}{2}$ to 4 inches long.

Affects cellars and damp places in houses, moist woody places, under stones, &c. Active and voracious, frequently finding its way to cream in dairies.

European originally, it ranges from Siberia to Corsica ; found in Madeira, and the Eastern Cities of the United States, having been introduced to the latter locality.

New Zealand : Dunedin and Greymouth (Hutton).

Queensland : Hedley saw what he believed to be an example of this species in Brisbane.

N.S.W. : Gladesville and Summer Hill (Brazier) ; Inverell (Duncan) ; Tamworth, on walls of a well (Musson).

Victoria : Benalla (Brazier).

Tasmania : Launceston (Hedley).

A specimen of this species came regularly to a flour bag in which there happened to be a rent. It was only on my going to the bag one night I found the slug gorging itself on the flour, although its slime track had been observed fresh at intervals for upwards of a fortnight.

ZONITES CELLARIUS, Müller, 1774.

Helix Sydneyensis, Cox, Mon. Australian Land Shells, species 19, p. 9.

A widely distributed species. Originally European, it has found its way to the United States, Madeira, Canaries, Cape Town and Palestine.

Often found in cellars, it also affects damp places under stones, logs, &c., in vicinity of towns.

New Zealand : Bay of Islands, Napier (Hutton) ; Auckland, under stones, especially about the various volcanic mounts (Musson).

N.S.W. : Sydney, abundant in gardens and cellars (Brazier).

Victoria : Melbourne (Kershaw).

Tasmania : Launceston (Petterd).

ZONITES NITIDUS, Müller, 1774.

Helix nitida, Cox, Mon. Aus. Land Shells, species 20, p. 9.

A native of Europe, ranging from N. Russia to Algeria, and as far as Thibet in Asia; it has found its way to North America, Japan and elsewhere. Found in damp places.

New Zealand: Lake St. John, Auckland, a dozen specimens, under logs (Musson).

N.S.W.: Darling Point, Lyndhurst and elsewhere, about Sydney (Cox); often found in hot houses (Brazier).

HELIX ASPERSA, Müller, 1774.

European in its origin, it is now very widely diffused through St. Helena, Mauritius, Cape of Good Hope, Brazil, United States, and New Caledonia.

A voracious animal, which has even been known to perforate birds' eggs for food. It inhabits gardens, old walls, &c.

New Zealand: common at most of the sea coast towns. Examples from Apua in the Bay of Islands are exceptionally thin, whilst shells from Auckland are of the variety *conoides* (thin, small, and conical).

N.S.W. Dubbo and Coonamble (Brazier); Sydney, very common in gardens, as at Elizabeth Bay and Double Bay. Dr Cox found a very interesting monstrosity of this form in the shape of a well marked turriculated specimen in his garden at the North Shore, Sydney.

The species is often seen sheltering in large quantities inside the cut hollow stems of bamboo; an interesting fact, if we remember that the most ancient of all known fossil land shells, from carboniferous beds in the United States, have been found inside calamite stems.

Our N.S.W. forms of this shell belong chiefly to the variety *tenuior* (smaller, very thin and transparent).

Tasmania common, near towns on coast.

Victoria: common, in and near Melbourne.

Nowhere do we find the large, thick shells so often seen in England.

It does not seem to occur at Brisbane. Neither Mr. Brazier nor Mr. Hedley has ever seen it in Queensland, nor have I ever observed it there. A curious fact.

HELIX NEMORALIS, Linné, 1758.

A fine yellow-banded shell, very variable; widely diffused throughout Europe. Introduced into United States.

New Zealand: Auckland (Hutton), our only record.

HELIX VIRGATA, Da Costa.

Generally confined to the sea coast. N. France, Italy, Greece, and N. Africa.

Mr. E. A. Smith in his report on "Mollusca of Voyage of the Erebus and Terror," 1843 and 1844, published in 1874, says, "Two specimens of this species are marked as coming from Foul Point, N.W. Coast of Australia (Richardson)," and adds that Mr. Gwynn Jeffreys records a sinistral variety as coming from N.S.W.

Nothing more is known about this species as inhabiting Australia.

It is figured in the volume quoted. Its belonging to the Australian fauna must be considered doubtful.

HELIX CAPERATA, Mont., 1803.

Widely diffused over the greater part of central and southern Europe, both inland and maritime; not common in the north.

Victoria: Melbourne, the typical form common in gardens for ten years past (Kershaw).

Tasmania: (Petterd *teste* Hedley).

HELIX PULCHELLA, Müller, 1774.

Helix Alexandræ, Cox, Mon. Aus. Land Shells, species 154, p. 61.

Common in Europe and North America; indigenous to both; found also in Thibet. Introduced into Madeira, Azores, Cape Town, Palestine, &c.

N.S.W.: Eastern Creek, in flood refuse (Brazier); Sydney, Petersham, Marrickville, Darling Point, Glebe, and other places.

Tasmania: Hobart, in gardens.

Norfolk Island: in the old gaol yard, 1865 (Brazier).

BULINUS ACUTUS, Muller, 1774.

Confined to the seaboard of Central and Southern Europe.

Mr. Petterd records in Journ. Conchology that during 1879 some examples of this species were forwarded to him. Dr. Cox also had some specimens about same time. Mr. Kershaw recently gave me examples (typical form) found by him in a Fitzroy garden, Melbourne. Probably the original locality for specimens received by Petterd and Cox.

HELIX SIMILARIS, Férussac.

A species of remarkably wide range, found in Cuba, N.W. America, Natal, Formosa, Mauritius, Hongkong, Sandwich Islands, Buenos Ayres, Brazil, Singapore, Bengal, Java.

Originally recorded for Australia from the Frankland Islands, collected by MacGillivray. Mr. Brazier, who had some of the original specimens, remarks that they were *H. aridorum*, Cox, and not *similaris*. The only locality known in Australia for *H. similaris*, Fér., is Sydney, where it is found in plenty after rain in gardens at Elizabeth Bay and at Guilfoyle's Nursery, Double Bay; no doubt brought with plants from Mauritius.

Cox remarks this shell is much like *H. marcescens*, Cox, found by MacGillivray at the Clarence River.

An interesting species which forms a thin, dry, and papery epiphragm.

Mr. Brazier tells us that amongst a large number of *H. similaris* from a Glenmore-road garden he found a reversed specimen.

Postscript.—Since the above was in type I have received from Mr. Hedley the following note: "Specimens of the slugs *Limax* *legrandi*, Tate, and *Milax* *Tasmanicus*, Tate, described in the P. R. S. Tas. 1880, p. 16, were collected by me during a recent visit to Tasmania. The first appears to be the European *L. agrestis*, and the second, as anticipated by the author, to be *L. gurgatus*, also introduced." 21st Feb., 1891.

NOTES AND EXHIBITS.

Mr. Hedley exhibited and offered some remarks on specimens of *Vaginula leydigi*, Simroth, and *V. hedleyi*, Simr., two interesting slugs from Brisbane, recently added to the molluscan fauna of Australia (*vide* Zoologischer Anzeiger, 1889, p. 551 ; and Abstr. in Journ. Roy. Micros. Soc., 1890, p. 21). These slugs are very abundant in the Brisbane botanical gardens, occurring also on lawns and in gardens in that part of the city which was formerly scrub land. After a shower they may be collected in abundance, crawling rapidly over the asphalt paths and the grass. *V. leydigi* is much commoner than *V. hedleyi*, which it resembles in shape, size, and habits, but from which its coloration distinguishes it in all stages of its growth, the former being a blackish-brown with a tawny yellow dorsal stripe, the latter a dark fawn without any stripe. These molluscs are the first real representatives of their genus found in Australia, the only *Vaginula* previously known here, *V. australis*, Heyneman, belonging to that trigonal group which embraces *V. prismatica*, Tapparone-Canefri, from Dutch New Guinea, *V. tourannensis*, Souleyet, from Cochin-China, and *V. trigona*, Semper, from the Philippines, constituting a natural but as yet unnamed genus. He also took the opportunity of pointing out that he had submitted specimens of *Limax queenslandicus*, Hedley (P.R.S.Q. Vol. V. p. 150, pl. 5), to Dr. Simroth, who had determined them to be *Agriolimax lævis*, Müller. This species is probably the slug (Journ. des Mus. Godeff. XII. p. 159) mentioned under the name of *L. rarotonganus*, Heyn., as occurring in Australia. Few if any land molluscs range so widely, since, under different names by various authors, this form has been recorded from Europe, North and South America, the West Indies, Madagascar, and many islands of the Pacific.

The Rev. Dr. Woolls sent for exhibition specimens of *Dodonæa attenuata*, A. Cunn., with both simple and pinnate leaves.

Mr. J. R. Garland sent for exhibition photographs of the fantastically weathered "clay cliffs" at Alfredtown near Wagga Wagga, together with a specimen of the formation, which may be described as a dull brick-red, micaceous, ferruginous sand rock.

Dr. Norton exhibited and made some remarks on the nuts of *Helicia Whelanii* from Queensland, sent to him by Mr. Bailey of Brisbane.

Mr. Musson exhibited a large general zoological collection from Narrabri and Tamworth, N.S.W., comprising insects (Coleoptera and Lepidoptera being most conspicuously represented), crustaceans (*Astacopsis*, *Palæmon*, and *Apus*), frogs and lizards; also Permo-Carboniferous fossils from the same localities. Also three specimens of the interesting mollusc *Cystopelta* recently obtained by him near Ballarat, Victoria, the genus previously having been recorded only from Tasmania, and Mt. Kosciusko, N.S.W. Also, on behalf of Mr. W. S. Duncan of Inverell, specimens of locusts (*Pachytylus australis*, Brunn), of which he reports that on Nov. 30th he found them in all the open country in countless millions; and of a butterfly (*Pieris leutouia*, Don), of which migratory swarms were in flight on 13th and 14th inst., making due east, the males preponderating, on an average, perhaps, about twenty to one.

Mr. Fletcher exhibited eleven living specimens of the handsome toad, *Notaden bennettii*, Gthr., received that morning from Trangie from Rev. J. Milne Curran, F.G.S.

Mr. North exhibited the eggs of the Torres Straits Pigeon described in his paper.

WEDNESDAY, JANUARY 28TH, 1891.

ANNUAL GENERAL MEETING.

Dr. J. C. Cox, Vice-President, in the Chair.

The minutes of the last Annual Meeting were read and confirmed.

The Rev. A. E. David, M.A., was introduced to the meeting as a visitor.

The Chairman then delivered the Annual Address, as follows:—

GENTLEMEN.—Under the very exceptional and melancholy circumstances in which I am called upon to address you this evening, I feel sure that at the outset I may confidently lay claim to your consideration and forbearance. But little more than two short months ago there seemed every prospect, humanly speaking, of our esteemed President completing his term of office in the usual manner, and of his addressing you on this the occasion of our annual reunion in his own happy and instructive manner. As you already know, events have happened otherwise.

The year which has recently closed has not been a whit behind some of its immediate predecessors in furnishing the community, as a whole or in part, with excitement, and abundant food for reflection. The preliminary steps towards making intercolonial federation a reality, a phenomenally wet season accompanied by floods, a strike of prodigious magnitude and far-reaching importance, a practical acquaintance with the influenza epidemic, and political unrest, have, among other events, effectually served to arouse public attention, and to prevent our relapsing into lethargy and indifference. To us, as a Society, it has been especially noteworthy as a year of bereavement. For though for a time, notwithstanding the combination of disturbing elements above referred to, our Society held quietly on the even tenor of its way undismayed

and disturbed to a minimal extent by the general unrest abroad, at last our serenity was rudely ruffled, and our hearts stirred by an event almost as unexpected as it was sad. And although the circumstances from their recent occurrence are still fresh in your memories, it especially befits the occasion of our annual gathering that I should again remind you of our loss and our obligations, and offer on behalf of the Society a humble tribute to the memory of our departed friend.

William John Stephens was born on July 16, 1829, at Levens, in Westmoreland, where his father was the vicar. He was educated first at the Haversham Grammar School, an ancient foundation which has turned out many distinguished scholars, and subsequently at Marlborough College, where he was one of the 200 pupils with which that institution opened. In due course he became captain of Marlborough, and gained the Latin Verse and English Verse prizes, the Plater prize, the Drawing prize, and the College exhibition. Before leaving Marlborough he won a Tabardenship at Queen's College, Oxford, and matriculated in that University. He took his B.A. in 1852, with first-class honours in classics, and third-class honours in mathematics and physics. Soon after he was elected fellow and appointed tutor of Queen's. Among his pupils during this period were Dr. Percival, formerly of Clifton, now headmaster of Rugby; and Dr. Thornton, Bishop of Ballarat. While at Oxford he read widely and deeply in the ancient classics, the love of which never afterwards deserted him. Here also he laid the foundation of that varied learning which eminently distinguished him. At Oxford, too, in his early manhood, he first took up the study of geology, and threw himself into that science with great zeal. To geology he soon added botany, in both of which he took keen interest.

In 1856, at the instigation of Sir Charles Nicholson, he applied for the headmastership of the Sydney Grammar School, which had just been founded, and he was elected to that position on the recommendation of Dr. Jowett. After ten years' work at

the Grammar School he resigned his headmastership, and established a school of his own in Darlinghurst-road, which was known as the New School, and afterwards as Eaglesfield. This school he continued to conduct till his appointment, in 1882, to the Professorship of Natural History at the Sydney University—the title of which was afterwards changed, upon a redistribution of work on the foundation of certain additional chairs, to that of Geology and Palæontology.

His death took place on Saturday, November 22, after short but severe illness, a fatal termination being unexpected until the day before his death. On November 24th his remains were followed to the grave by a large concourse of friends, colleagues, and official representatives of the various institutions and societies with which he had been connected, old pupils, and University students.

For a period of nearly thirty-five years then Professor Stephens lived in our midst, labouring uninterruptedly in the cause of higher education, yet finding time and inclination to give the colony at large the benefit of his extensive knowledge and experience by his connection with several of our important public institutions such as the Public Library of which he was Chairman of Trustees, and the Australian Museum of which he was a member of the Board. For a time also he was President of the Sydney Branch of the Geographical Society of Australia. In his favourite pursuit of Natural Science he was actively identified firstly with our fore-runner, the Entomological Society of New South Wales, and afterwards with this Society dating from its inception, having been a Member of Council during the years 1875 and 1876, President in 1877 and 1878, Vice-President in 1879 and 1880, Co-Honorary Secretary in 1881-84, and again President from 1885 to the close of his life in November 1890.

His contributions to our Proceedings include seven Presidential Addresses, in addition to a number of important papers bearing on Geology and allied subjects.

Thus by the death of Professor Stephens not only has this Society been bereft of its official head for the time being, and of one who, in the course of his long official connection therewith had evinced a warm interest in its welfare, backed up by assiduous efforts for its progress, but many of its members have lost a personal friend not less appreciated for his modesty of character and for his warm-hearted generous nature than he was admired for his scholarship and learning; and the loss to the colony of one so experienced in educational matters is a loss it can ill-afford to sustain.

In addition to our late President, we have to deplore the removal by death of four other members,—Dr. Mann, F.R.G.S., elected in July 1890 who died in November following; Mr. Justice Mein, M.A., of Queensland, elected in 1883; Mr. Felix Ratte, the contributor of a number of important papers contained in Vols. IX, X and I, II (2nd Series), elected in 1883; and Dr. Reginald R. Read, an original member of the Society

The number of members at present on the roll is 158. five members, as mentioned above, having deceased, two having resigned, and the names of fourteen having been removed from the roll for continued neglect to fulfil their obligations to the Society

In June the Council elected Mr Charles Hedley, F.L.S., of Brisbane, a Corresponding Member

In prospect of a lengthy absence from the colony Dr. George Hurst in July felt called upon to resign his position on the Council, whereupon the Council elected Mr. T. G. Sloane to fill the vacancy

A considerable addition has been made to the library during the year, by donation or exchange, to the extent of 207 Volumes, 660 Parts of Volumes, 120 Pamphlets, and 34 Official Reports.

The usual number of Meetings was held, at which fifty-two papers of varied interest were submitted, and many interesting exhibits brought under notice

Three Parts of the Proceedings for 1890 have been published, and issued to those entitled to receive them ; the concluding Part of the Volume is already well advanced.

In the early part of the year Mr. Henry Deane, M.A., most generously deposited with the Society for the use of Members the greater portion of his extensive and valuable collection of Australian plants. This addition to the collection already in the herbarium now offers considerable advantages to members desirous of increasing their knowledge of the Australian flora, and it is to be hoped not only that others will emulate the commendable example of Mr. Deane, but that the opportunity now afforded of referring to named collections will stimulate the pursuit of botany among our members.

You will have noticed, not without concern, that for the second time our Annual Volume appears without a contribution from the Society's most consistently regular and enthusiastic worker in the past, as his long series of contributions contained in the first thirteen Volumes of our Proceedings testifies. I am sure that I but re-echo your sentiments when I say that, while we deeply regret that, in the interests of his health, Sir William Macleay has for some little time past found it advisable to abstain from the active prosecution of those biological studies which have so long and so enthusiastically occupied his attention, and by which the Society has so abundantly profited, or for similar reasons from keeping up his attendance at our meetings with that exemplary regularity which has for so long characterised him, we at the same time venture to express the hope that his well-earned rest from active service will tend not only to invigorated health, but also to prolong his life, so that in guiding the affairs of this Society and in watching over its welfare we may long have the benefit of his extensive knowledge and ripe experience.

Among the events of the year at home there are several worthy of notice on this occasion.

First, I may mention the publication of the researches of Mr. A. S. Woodward, F.Z.S., F.G.S., of the British Museum, on

"The Fossil Fishes of the Hawkesbury Series at Gosford,"* a contribution to our knowledge of the Hawkesbury formation of the greatest interest and importance. References to the collections will be found in two papers by Professor Stephens in Vol. I (2nd Ser.), p. 1175, and II, p. 156 of our Proceedings. In an introductory note to Mr. Woodward's monograph, Mr. T. W. Edgeworth David, B.A., deals with the stratigraphical position of the Gosford fish-bed, in reference to which he says that it is at present "doubtful whether the bed belongs to the lower portion of the Hawkesbury Sandstone or to the upper portion of the Narrabeen Shales." The series of nearly 400 specimens was richer in individuals than in representatives of many species, Mr. Woodward distributing them among the various orders represented as follows:—One Selachian of the family *Cestraciontida*, one species of a new genus (*Gosfordia*) of Dipnoi, the remainder being referable to nine genera (two proposed as new) and seventeen species (all but two being new) of Ganoidei. In concluding his paper Mr. Woodward says, "perhaps the most important fact, however, is the absence in the Hawkesbury beds of fishes with well developed vertebral centra. . . . So far as can be determined from the fishes, therefore, the Hawkesbury beds may be regarded as homotaxial with the Keuper of Europe, or, at latest, with the Rhaetic."

The monograph is well illustrated; and we must congratulate not only Mr. Woodward on the successful issue of this excellent piece of work, but the Department of Mines on its publication of the volume within the colony.

To the same Department all who are interested in the study of the geology and palæontology of Australia owe a debt of gratitude for a translation, revised to 1887, of Dr. O. Feistmantel's "The Palæozoic and Mesozoic Flora of Australia and Tasmania,"—issued as No. 3 of the Palæontological Series—thus bringing this most important work within reach of many in the colonies to whom it has hitherto been inaccessible or practically so.

* Issued as "Memoirs of the Geological Survey of N.S.W., Palæontology, No. 4." Sydney, Government Printer, 1890

Mr. Etheridge's "Catalogue of Works, &c., on the Anthropology, &c., of the Australian and Tasmanian Aborigines." Part i. (issued as No. 8 of the same series); Mr. Whitelegge's "List of the Marine and Fresh-water Invertebrate Fauna of Port Jackson" (Journ. Proc. Roy. Soc. N.S.W. XXIII. p. 163), Mr. Froggatt's "Catalogue of the described Hymenoptera of Australia." Part i. (in our own Proceedings), and Mr. North's "Descriptive Catalogue of the Nests and Eggs of Birds found breeding in Australia and Tasmania" (Austr. Mus. Cat. No. 12), continue the series of catalogues, bibliographical or systematic, and censuses, zoological or botanical, so useful to students in the colonies where good libraries are very few in number, and so helpful in economising both time and energy.

Three important innovations during the year are the establishment of a Department of Agriculture, a Department of Forestry, and of country branches of the Technological Museum.

It is to be hoped that in this colony the carrying on of agricultural operations will now gradually but steadily come to be modified in accordance with, and to be based upon, the teachings of science, which hitherto have been somewhat out of reach of many of our agriculturalists, who have had to battle more or less helplessly against the attacks of injurious pests, animal and vegetable. Indeed the necessity of conducting agriculture on scientific principles is one which has for some time past occupied the attention of our neighbours in Victoria and South Australia, from whom in the course of the year we received the "Eighth Progress Report of the Royal Commission on Vegetable Products," and Bulletins Nos. 1, 6, 7, 9-11, of the Victorian Department of Agriculture; and Proceedings of the First Congress, Agricultural Bureau of S.A. (1890). These, with their forerunners, together with the publications of our own Department ("Agricultural Gazette," Vol. I, Nos. 1-3, "Bulletin" No. i. and Turner's "Census of Grasses"), and Mr. Tryon's Report on Queensland Pests No. i, make up a very bulky contribution to the literature of the subject. But while rejoicing that the necessity for taking

action in these matters is gaining ground, and becoming more widely acknowledged, and while also recognising the value of these publications, one cannot but feel that there is also represented here some waste of energy. Climatic conditions, as well as insect, fungoid, and other pests recognise no intercolonial boundaries, nor do the scientific principles which ought to regulate the operations of the agriculturalist and the pastoralist in South Australia, differ materially from those needful to guide his fellow worker in Victoria, New South Wales or Queensland. And though competition within reasonable limits is both desirable and beneficial, yet there is so much to be done that a certain amount of intercolonial federation for scientific purposes not only in bringing about wise and uniform legislation, but in parcelling out the work to be attempted, and in sharing results, might and probably would, prevent unnecessary duplication and triplication of work, and of issuing reports, events which are likely to happen if each colony works independently, instead of the whole of the colonies unitedly. Indeed I find that the late Mr Frazer S Crawford, whose recent death our South Australian friends have so much reason to deplore, in his evidence before the Victorian Royal Commission pleads for the establishment of a "central department for the south-eastern group of colonies, after the style of the American Department of Agriculture"; though at the same time he expresses a fear that the idea may seem Utopian.

Certainly the year 1890 has been prolific of swarms of animal life, not always beneficial, as well as of the attacks of fungoid pests. To some of these your attention has been drawn from time to time at our meetings by the exhibition of specimens, and by the remarks which these provoked. Early in the year many vineyards in certain districts both in this colony and Victoria were infested by myriads of bugs which I am informed by Mr. Skuse, who has submitted specimens to Dr. Bergroth of Finland, are probably an undescribed species of *Nysius* (family *Lygaeidae*), a genus not hitherto recorded from Australia.

Last summer and again this year pastoralists in the eastern colonies and South Australia have been troubled with plagues of

locusts (sometimes referred to as *Pachytylus australis*, Brunn., but reported as *Chortologa australis* by Mr. Koebele, as determined by Saussure), which this year especially have so accumulated in places as to impede railway traffic on some of our country lines by reason of the greasiness imparted to the rails. Mr. Koebele in his report quotes the opinion of a South Australian observer "that only in such unusually dry seasons as the present (1888) would the locusts migrate, there being no food left for them in the interior of South Australia." This hypothesis does not seem to be borne out by the experiences of last year which was anything but a dry one. As yet we have had only preliminary reports on these matters. There is much room for investigation on the lines laid down in an article in "Nature" (Feb. 27th, 1890, p. 403) based on a Report by Mr. Cotes of the Indian Museum, Calcutta, from which we learn that India has been somewhat similarly plagued with locusts of recent years. Locusts are not altogether a new pest with us, though records of their depredations in the past appear to be scanty, and their visitations not to have been of so desperately destructive a character; nevertheless a few references to their prevalence in this colony in former years will be found in Mr. Russell's "Climate of New South Wales," p. 27. It is also possible too that we are now in some measure reaping the results of the reckless and wanton destruction of many of our native birds which has been going on for so long.

In this connection also phylloxera as well as rabbits might also claim mention, though I need not go into details.

The past year has also furnished us with instances of migratory flights of butterflies of at least one species *Belenois* (*Pieris*) *teutonia*, Don., as reported at our last meeting. The specimens then exhibited were from Inverell, but in the *Echo* of recent date, swarms, probably of the same species, were reported from Emmaville. In Vol. VII of our Proceedings will be found a record of similar swarms of the same species observed at Tamworth by one of our members in December, 1882.

In this, as in other cases of animals which periodically attract notice by their appearance in migratory swarms, our country

members will do well to be on the alert in observing and recording, as we have much yet to learn in these matters, and the records of the past are neither so complete nor so systematic as is to be desired.

Dr. A. Barclay, of the Bengal Medical Service, early in the year contributed an important paper to the Asiatic Society of Bengal, in which he deals with the subject of the prevalence and character of Rust and Mildew on wheat in India. The number of the journal containing this paper has not yet reached us, but the gist of it will be found in another paper by the same author in the "Journal of Botany," XXVIII, p. 257 (September 1890), from which I take the following passage:—"So far as I have been able to gather, the most prevalent form of rust on wheat, barley, and oats in India is *Puccinia rubigo-vera*, D.C., and not *P. graminis*, Pers. And this is true even of the outer Himalayan region, where rust is very prevalent, and where three species of barberry are common (*B. lycium*, Royle; *B. aristata*, D.C., *B. vulgaris*, L.), one of which, *B. lycium*, bears an *Æcidium* abundantly. At the same time, I have never been able to find an *Æcidium* on any species of Boraginææ in the Himalayan region, and none is known on the plains. Whilst *P. rubigo-vera* is apparently by far the commonest rust in India, *P. graminis* is not wholly unknown. I have received specimens of *P. graminis* from Jeypore, about 200 miles in a direct line from the nearest known habitat of barberry, but I have never seen a specimen on the crops actually in the neighbourhood of *æcidium*-bearing barberry. These facts are sufficient to show the mystery in which the subject here is involved, and that it needs much more study before anything useful can be written on it. The fungus on *Linum* ("Ulsee") is apparently extremely common over large areas of the plains. It is often so closely concurrent with rust on wheat and barley, that the uredo stage on *Linum* has often been supposed to be the cause of the rust on wheat. This supposition, however, cannot be entertained, with our present knowledge, by botanists. The fungus on *Linum* is probably a complete autochthonous species."

I especially draw your attention to this matter because our fellow-member, Dr. Cobb, whose recent accession to our little band of working members we are glad to welcome, and who since his connection with the Department of Agriculture has had under investigation the question of rust on wheat in this colony, at an early stage of his observations also found that in the specimens submitted to him by far the commonest rust was *Puccinia rubigovera*, D.C., and not *P. graminis*. This result was some months ago announced in the daily papers, and full particulars are given in the "Agricultural Gazette," Vol. I, No. 3, p. 185.

To the newly established Forest Department our hopes turn not only for a check to the wholesale destruction of timber which has been going on for so long, to the conserving of such areas as are still available, and to the planting and replanting of suitable tracts of country, but for the realization in this colony of a matter touched upon by Baron von Mueller, in his presidential address at the second meeting of the Australasian Association, namely the setting apart of areas in different and suitable parts of the colony in which the vegetation and its accompanying fauna may be left untouched, and preserved for educational purposes. Surely our utilitarian necessities are not of so pressing a character as to require every square foot of our richest and best timbered areas to be delivered up to the settler's axe and fire-stick. Comparatively few of even our native-born population know by experience, from artistic representations, or even by adequate description, the beauty and luxuriance of our brushes and semi-tropical scrubs, now alas in danger of altogether disappearing. As means of communication improve, as they are steadily doing, such districts as I speak of will be gradually brought within easy reach of the metropolis, and thus become more accessible to the naturalist, the artist, the writer, and the lover of nature, let us hope not when it is altogether too late, and when the characteristic vegetation has entirely disappeared.

Of the good likely to accrue from the establishment in some of our country towns of branches of the Sydney Technological Museum much may I think be anticipated. The conditions of

existence in a young country like this seem naturally to lead to more or less centralisation, in scientific as in so many other matters. Now the dulness attendant upon life in an average country town to the man who is not duly fortified against it by the pursuit of some rational hobby is a stern reality often leading to misapplied energies and utter waste of time, not to speak of the acquisition of undesirable habits. Yet very often it is in the immediate neighbourhood of just such localities that there are special opportunities of observing particularly interesting species of plants or animals in a state of nature, of working out the stratigraphical or palæontological relations of particular strata, of obtaining important data relating to the scientific aspect of mining, or of collecting relics and traditions of the fast disappearing black-fellow; and too frequently it is exactly in such localities that such opportunities excite little or no interest whatever. Not absolutely always, however, I am glad to be able to state, since we number among our own members a few who under such circumstances have risen to the occasion; but our Societies want more of such men, and the colony at large needs more of them. Country museums in the hands of judicious curators alive to the value of their opportunities may become directly educative, and do much towards supplying the present want of means of fostering a love of nature in the rising generation, as well as offer a counter attraction to those very much less rational and undesirable ways of "killing" time, which too frequently present themselves. In answer to my enquiries Mr Maiden has been good enough to furnish me with the following particulars which I am glad to make use of —

"Local museums in connection with the Sydney Technological Museum have been established at Goulburn, Bathurst, West Maitland, and Newcastle, and another will shortly be opened at Broken Hill

"The exhibits are housed in substantial buildings—the large halls of the Mechanics' Institutes being rented at Goulburn and Newcastle, while at West Maitland the large hall of the old Masonic buildings is utilised.

“At West Maitland the local Science Association has presented its valuable natural history collection to the Museum, and at the other centres scientific societies have been started which will assist in the ‘working up’ of the museums, so that most of these museums will contain a natural history side as well.

“The local science master, or head of the local Technical School, is the curator, and he corresponds direct with the Curator of the Sydney Technological Museum in matters of museum detail. He is quite at liberty to devote a portion of his time to original research, or to give lectures, &c.

“Each museum contains about 2000 specimens exhibited in suitable show-cases. Endeavours are being made to form in each museum a display of the products of the district in which it is situated, and substantial additions to the collections have been received already. Numerous applications for the formation of museums in different centres of population have been received, but at present it is proposed to confine them to towns in which technical colleges have already been founded.”

In his last Presidential Address Professor Stephens took occasion to mention that of the 125 original members with which the Society started only 24 still retained their membership, and he placed on record the names of the veterans. By a remarkable and erroneous inversion of terms the editor of one of our newspapers was led to believe that the total number of members of the Society had dwindled to 24; and accordingly he did us the unaccustomed honour of devoting a leading article to the consideration of our affairs, in which he somewhat oracularly disposed of the cause of our supposed premature decay in a very simple manner. Doubtless many of you read the article in question with feelings somewhat akin to those of the man who is called upon to read an obituary notice of himself. Said our critic “The Annual Meeting of the Linnean Society was held last night. It is with regret that we observe the decay numerically of this admirable Society, which in the past has done so much excellent work in the field of natural science. The original number of members was

125. The roll is now only 24, and of these the majority is composed of members of the original 125. Here we have a curious example of the vicissitudes which attend scientific societies in a new country. With the increase of population the number of scientific men in the community has, it would appear, decreased. The explanation of this paradox is simple enough. In the early colonising days, among others, a large number of cultivated scientific men found their way here, attracted by the great prospects then offered to men of learning and ability in the young community, and lured, too, doubtless, by the fascinations of a country which was altogether new. There are not now the same inducements to colonists of any description as there were then to colonists of all kinds. Consequently the influx of scientific men has fallen off; and unfortunately, perhaps inevitably, Australia has not yet produced a sufficient number of scientists to supply the places of the men of old-world culture who in the course of nature are gradually dropping out of life. Science, like Art and Literature is a growth of a comparatively perfect state of society. That state we have not yet reached. The men with scientific proclivities and attainments who came to these colonies in earlier days were the founders of the various scientific Societies which now exist."

Even granting the premisses, some at least of the arguments here advanced are fairly open to question, and this without disparagement to the memories and excellent qualities of many of our early colonists, the names of some of whom must ever be associated with the story of the development and progress of this country, not only in material things, but also in regard to culture and refinement, to science as well as to art; and I have only referred to the matter on this occasion because I am thereby reminded of another question which is well worthy of our consideration, as it seems to me

Firstly, however, let me assure the members of the Society, and any others who take an interest in our welfare, if indeed any assurance be needed, other than the satisfactory work of the past year

and the present prosperous state of its affairs, that so far from falling into a state of decay, numerically or otherwise, the Society is still vigorous and flourishing, and will, I have no doubt whatever, in due course follow the recent example of its great English prototype, the Linnean Society of London, and celebrate its centenary anniversary in a manner befitting the occasion.

In each of the Australian colonies, with the exception of Western Australia, at the present time there is and has been for a more or less lengthy period at least one Scientific Society. Now I believe it to be a fact that those who are especially interested in these societies, and who are called upon to watch over their welfare, have at least one experience in common, and that is that at some time or other they are called upon to consider, individually or collectively, why it is that, having regard to the steady increase of population, and to the great value of the work done by such societies, there does not seem to be something like a proportional increase in the number of those who show a practical interest in the progress of our Scientific Societies.

From its large extent, its long and complete isolation, and the correspondingly interesting characters of its archaic fauna and flora, and yet withal from the facility of access through increased settlement to its most remote districts, its being solely under the beneficent rule of one enlightened nation, the minimal amount or entire absence of danger to be apprehended from malarial climates, from wild beasts, and from hostile tribes, an unrivalled opportunity is offered of working up completely and satisfactorily the fauna and flora of one of the great tracts of the earth's surface under the most favourable circumstances, and with greater certainty and ease than is possible, under present conditions, in the case of almost no other portion of the globe of equal extent. Already this has been done for the phanerogamic portion of the flora, as well as for the vascular cryptogams, so that we have it on the best authority that the "*Flora Australiensis* is the first flora of any large continental area that has ever been finished." Much, of course, remains to be done in the matter of

the lower cryptogams, and in regard to the morphology of the phanerogams, and to problems arising therefrom. But even with such limitations, when is such a statement concerning the fauna to become possible; and at the rate at which things are progressing, is it likely to be before our hundredth anniversary?

Systematists abroad have done in many groups pretty nearly all they can do for us; their work now wants supplementing and revising by resident naturalists, who have the opportunity of examining abundant stores of fresh or living material studied in the light of natural surroundings. Morphology and Embryology, necessitating well-equipped laboratories at present hardly existing outside a few of our universities, are having too long a holiday. Our museums contain abundant supplies of untouched and unworked material, while some groups of our more inconspicuous invertebrates have hardly yet been systematically collected. Our fisheries need developing on a scientific basis, nothing systematic as yet having been attempted in the way of investigating the life-histories, habits, and food-supply of our food-fishes, to say nothing of so important a question as fish-cultivation. Moreover, delay is to be deprecated, because the advent of civilised man with his numerous animal and vegetable introductions, intentional and unintentional, and by his modification of extensive tracts of country through the removal or destruction of the timber, has already seriously disturbed the 'balance of nature,' and is succeeding only too well in his at any rate partial extermination of more of the indigenes than is desirable.

Truly then, in spite of all that has yet been accomplished, and even leaving out of consideration for the moment such equally important matters as the completion of the geological survey of, let us say, one single colony, something approaching a detailed knowledge of Australian petrology, or an exhaustive study of the therapeutic and economic possibilities of our native plants, there is an abundant and promising harvest to be gathered, involving much arduous and patient work. This being so, how is it that our own workers are so few in number?

This question, involving as it does so many side issues, such as the endowment of research, the question recently dealt with by Professor Thomas as to whether our Museums do all they are capable of as educational agents, with others of equal importance, is too complex to be dealt with exhaustively on the present occasion. But there is a three-fold aspect of it upon which however I shall venture a few remarks.

Firstly, there are in my opinion two great causes in action which militate against a marked increase in the number of enthusiastic amateur naturalists. With very rare exceptions our children are growing up purblind to the beauties and attractions of nature which surround them on every hand, because our present conservative modes of education do so little either to cultivate their powers of observation, or to arouse and nurture an interest not only in Nature in the abstract, but particularly in those special and profoundly interesting features of Nature as she presents herself under these Australian skies, where, as Wallace aptly puts it, "the flora and fauna preserve to the present day the *facies* of an ancient geological epoch." Young Australia thus bids fair to continue to offer in these matters only too forcible an illustration of the old adage that "familiarity breeds contempt," and in too many cases in after life to lament with Thomas Carlyle that, "For many years it has been one of my constant regrets that no schoolmaster of mine had a knowledge of Natural History, so far, at least, as to have taught me the grasses that grow by the wayside, and the little winged or wingless neighbours that are continually meeting me with salutation that I cannot answer as things are."

The second cause to which I refer is that even when, in spite of drawbacks, an inherent love of Nature asserts itself our amateur finds himself too often hampered and crippled by the want of well-illustrated handbooks written from an Australian point of view, or descriptive catalogues, in the absence of which he not only often has the greatest difficulty in determining some of our very common and familiar types, but also pursues his studies under such unsatisfactory conditions as to be unable to turn them

to account for the benefit of others. This is an evil time, no doubt, will cure, but meanwhile though there is a prospect of the 'grass growing the steed is starving.'

And if, thirdly, we inquire how it is that so few of our colonists, native born or otherwise, devote themselves seriously to Science, notwithstanding that our local Universities now offer facilities for acquiring a scientific training, what better or more complete answer can be given than the following weighty words of Huxley's, which go straight to the root of the matter:—

"The other day, an emphatic friend of mine committed himself to the opinion that, in England, it is better for a man's worldly prospects to be a drunkard, than to be smitten with the divine dipsomania of the original investigator. I am inclined to think he was right. And, be it observed, that the question is not, whether such a man shall be able to make as much out of his abilities as his brother, of like ability, who goes into Law, or Engineering, or Commerce; it is not a question of 'maintaining a due number of saddle horses,' as George Eliot somewhere puts it—it is a question of living or starving. If a student of my own shows power and originality, I dare not advise him to adopt a scientific career; for, supposing he is able to maintain himself until he has attained distinction, I cannot give him the assurance that any amount of proficiency in the Biological Sciences will be convertible into, even the most modest, bread and cheese. And I believe that the case is as bad, or perhaps worse, with other branches of Science. In this respect Britain, whose immense wealth and prosperity hang upon the thread of Applied Science, is far behind France, and infinitely behind Germany" (*Science and Culture*, p. 55).

If these remarks are true of England, in how much greater a degree do they apply to Australia?

Believing as I do that a demand would create a supply, may we not, under the conditions of pressing work to be done which I have already sketched, look forward with hope, if not with confidence, to the day when in respect of position, prospects, and

chance of preferment, our young men properly trained and equipped for science will have something like an equal chance in the race for life with their confrères at the bar, in politics, in medicine, in commerce and in other avocations.

On the motion of Mr. Henry Deane, M.A., a hearty vote of thanks was accorded to the Chairman for his interesting address.

The Hon. Dr. Norton, Hon. Treasurer, laid before the Meeting his financial statement, and concluded by saying "I have further to report that by deed of 5th December, 1890, Sir William Macleay has transferred to the Society the Linnean Hall, with the land on which it stands having a frontage of 179 feet to Bay Street by a depth of 120 feet; and that by deed of the same date Sir William has also transferred to the Society by way of endowment a mortgage of £14,000 bearing interest at the rate of £5 per cent. per annum. The deeds by which these transfers have been effected are now in my hands."

On the motion of Mr. R. Etheridge it was unanimously and most gratefully resolved that the heartiest vote of thanks possible be accorded to Sir William Macleay in recognition of the latest of his many munificent benefactions to the Society; and that the Chairman be requested to give effect to the resolution.

The following gentlemen were elected

OFFICE-BEARERS AND COUNCIL FOR 1891.

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VICE-PRESIDENTS:

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HONORARY TREASURER:

THE HON. JAMES NORTON, LL.D., M.L.C.

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	THOMAS WHITELEGGE, F.R.M.S

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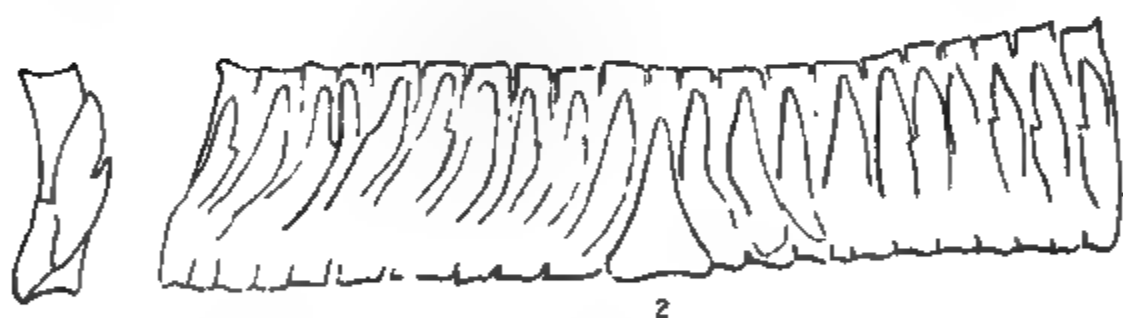
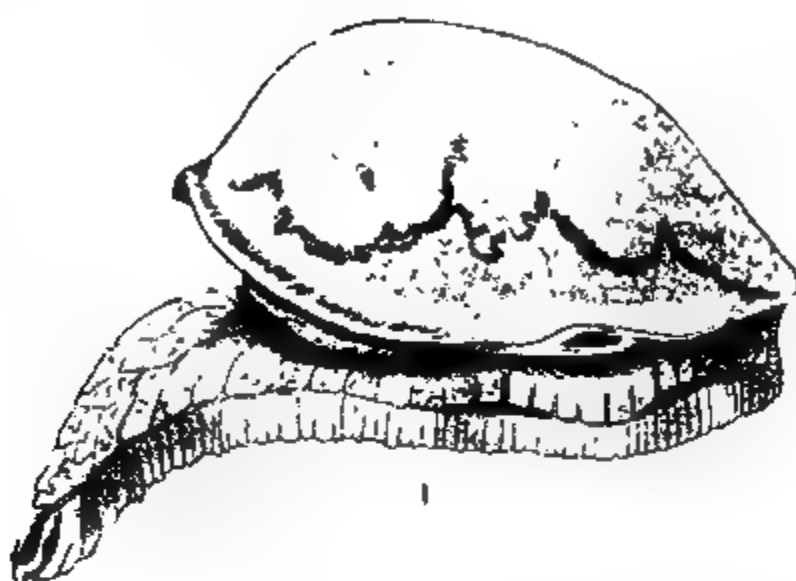
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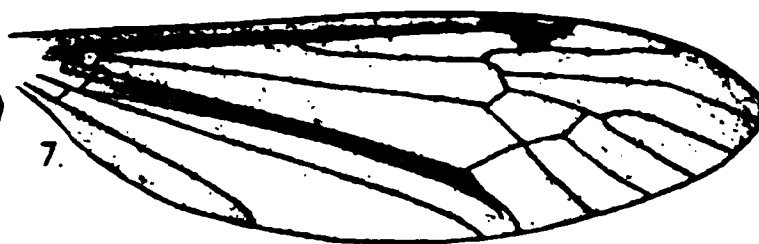
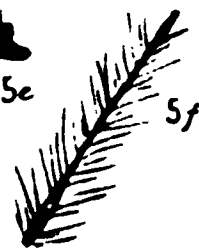
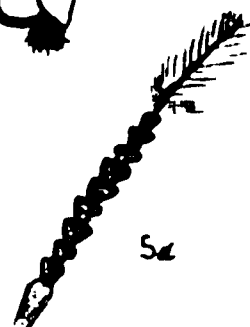
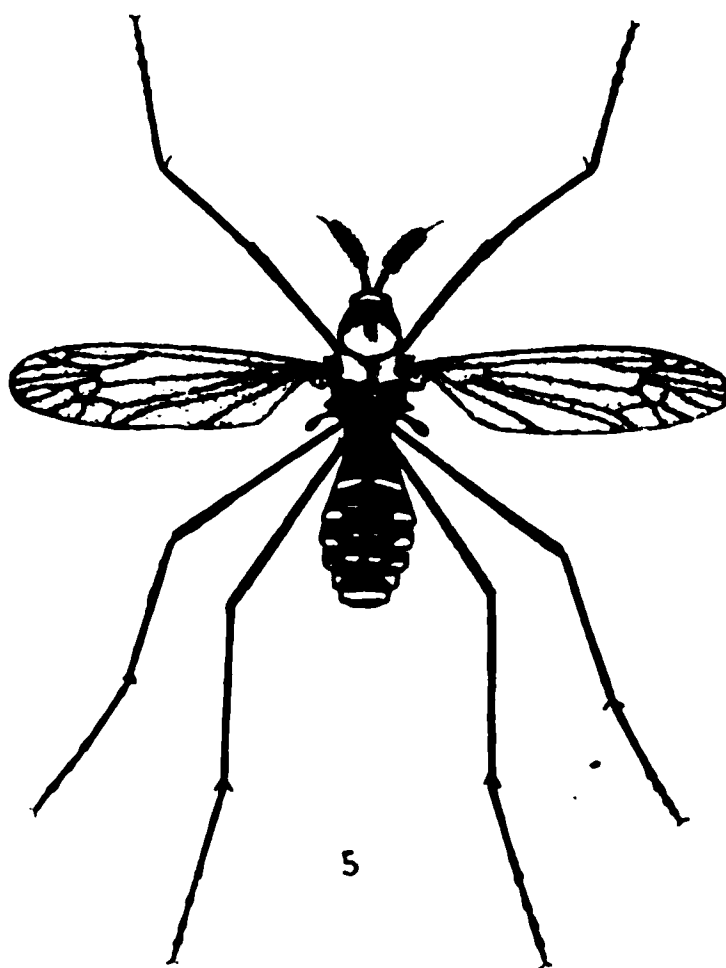
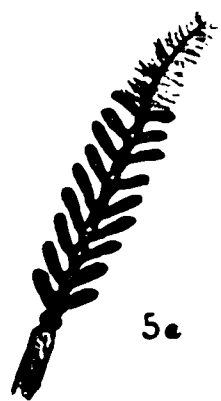
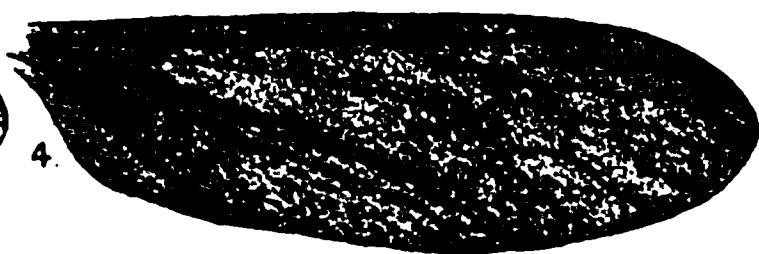
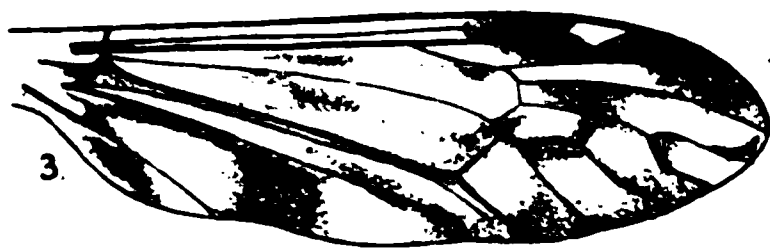
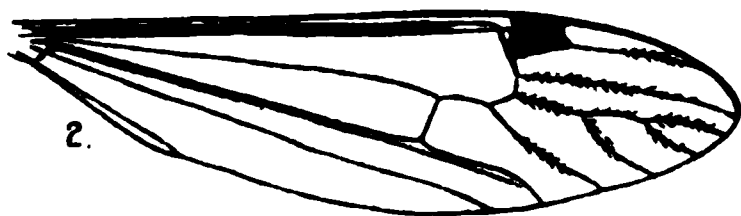
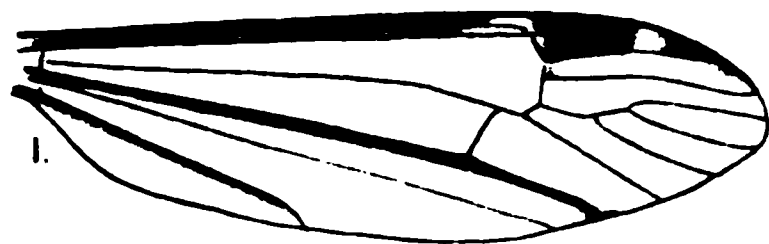
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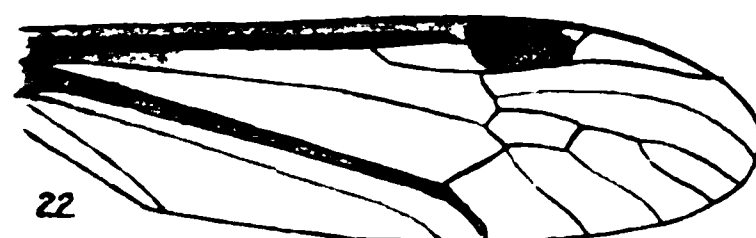
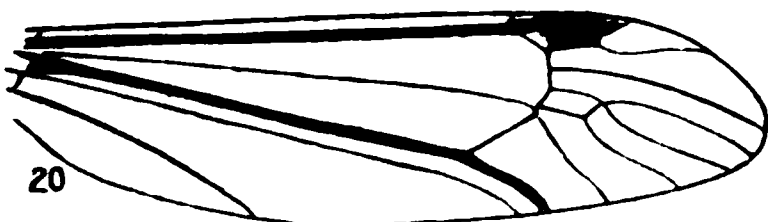
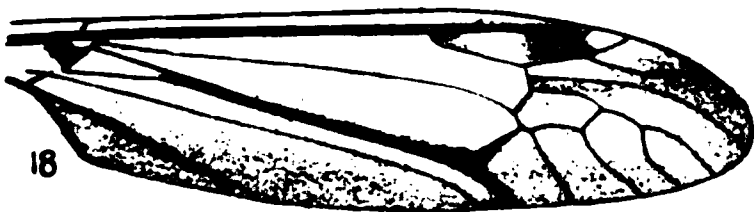
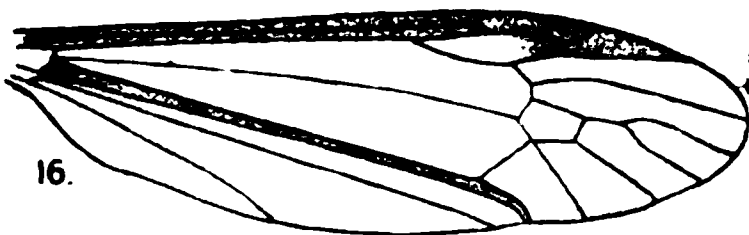
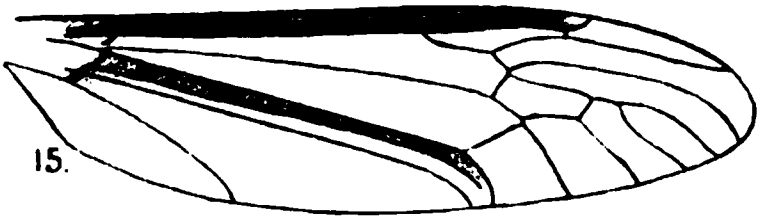
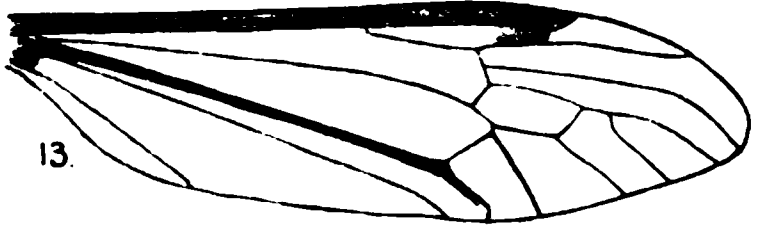
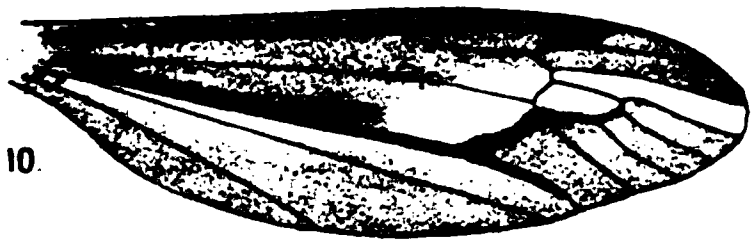
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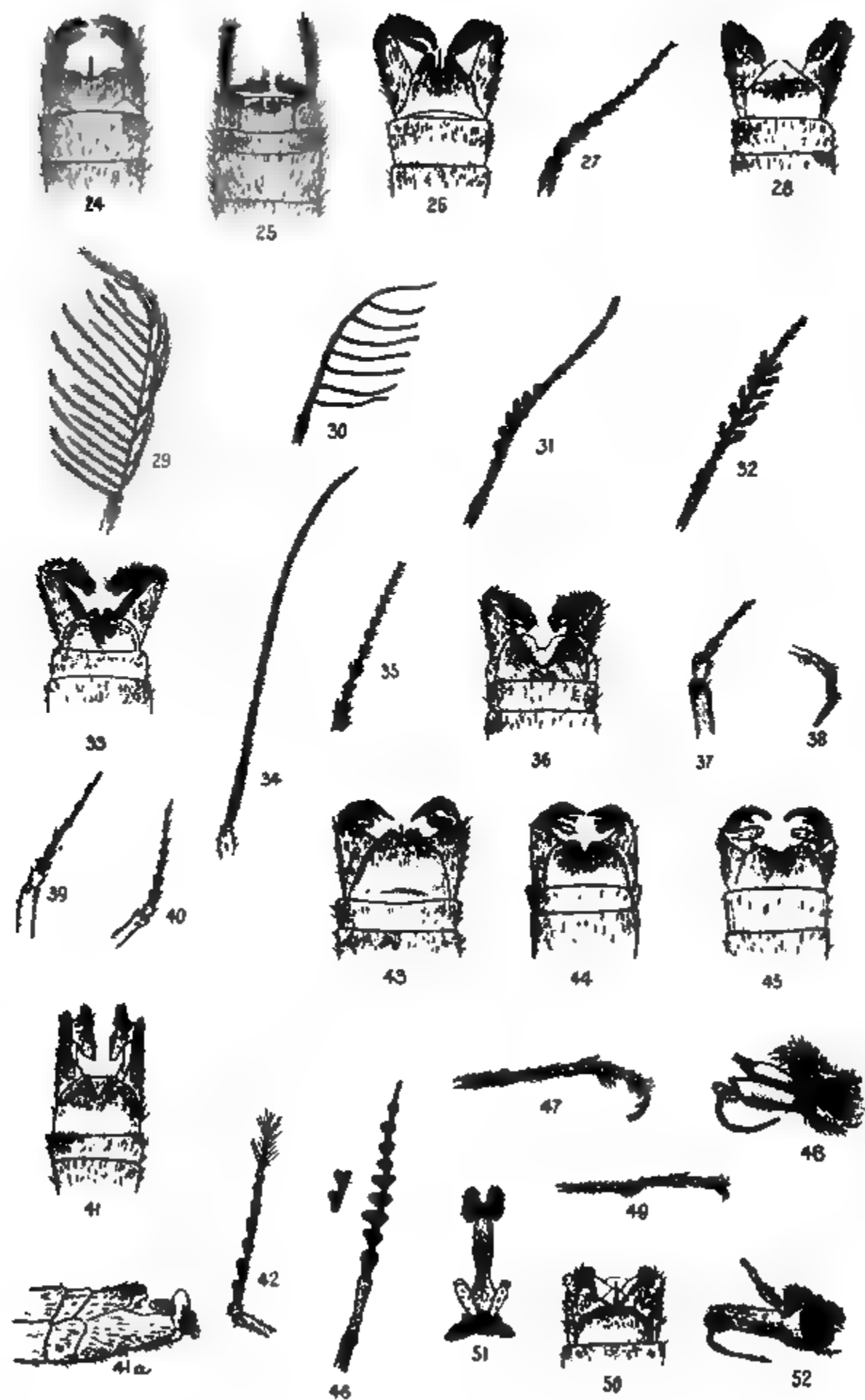


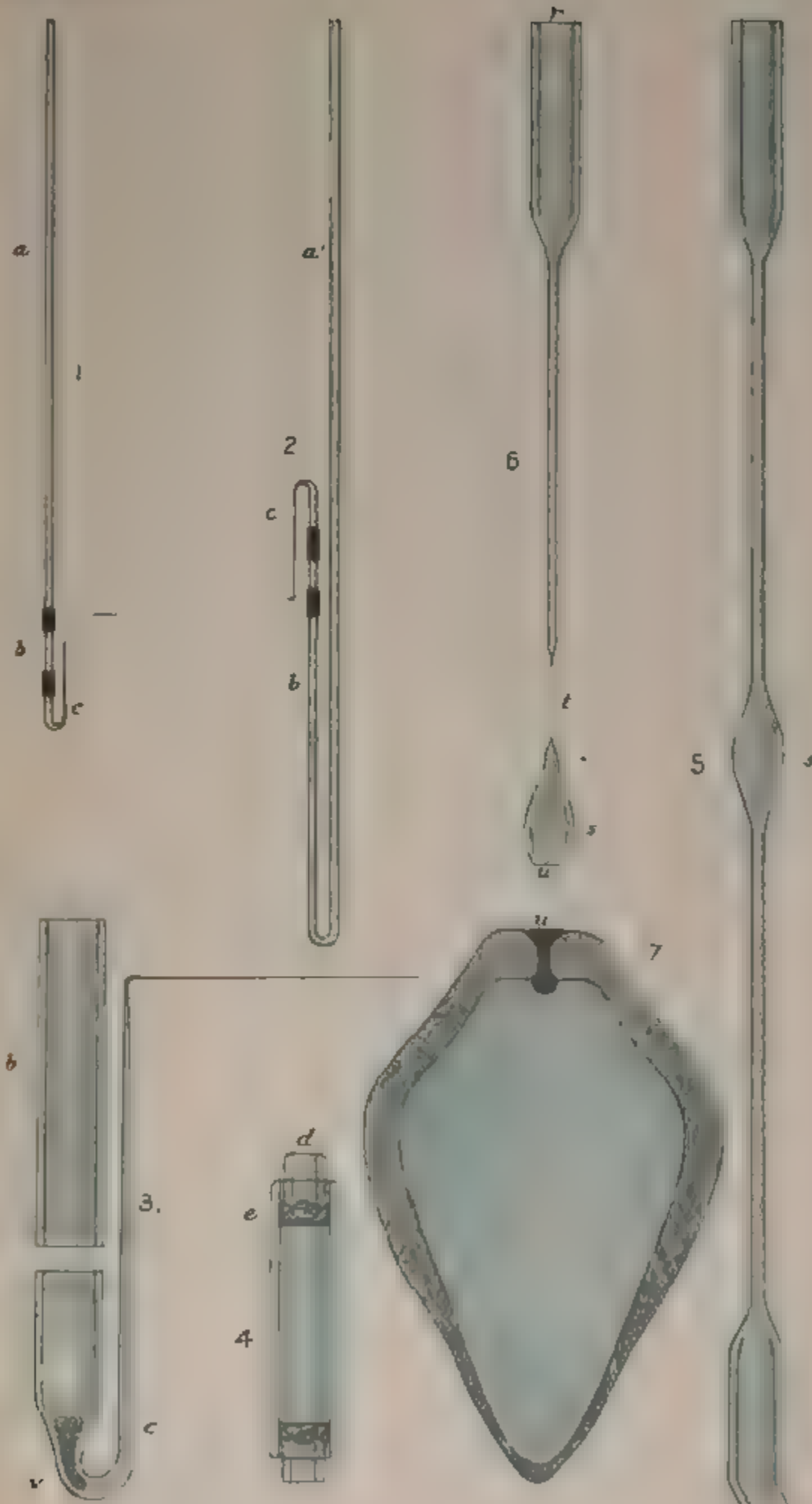


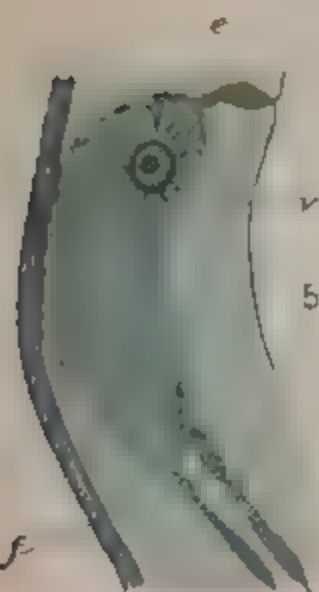
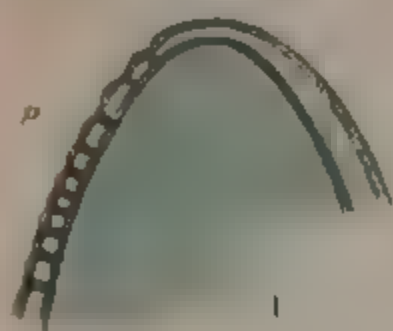


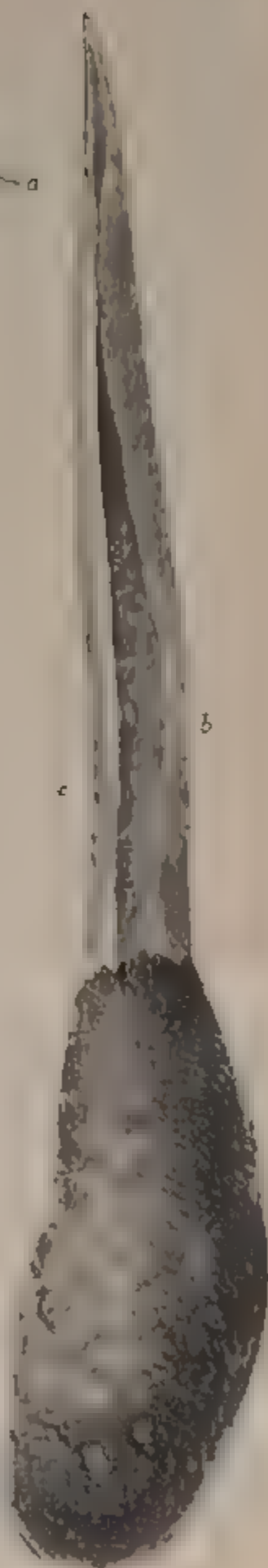
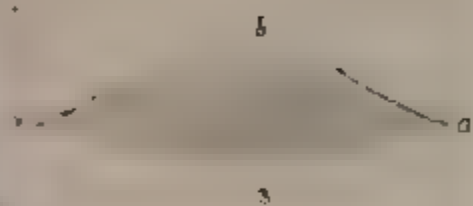
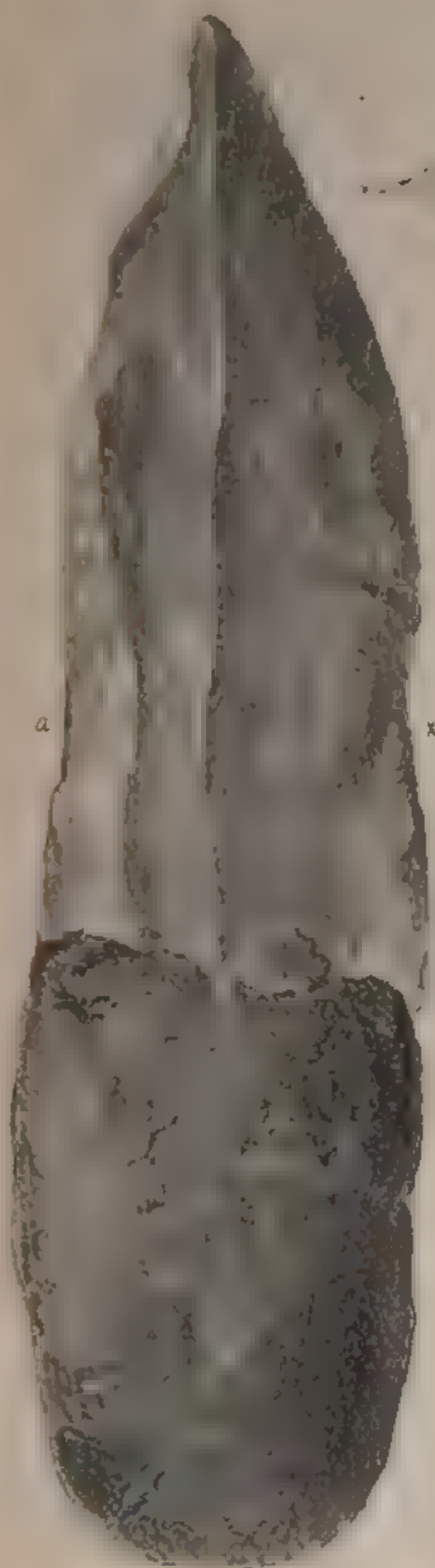














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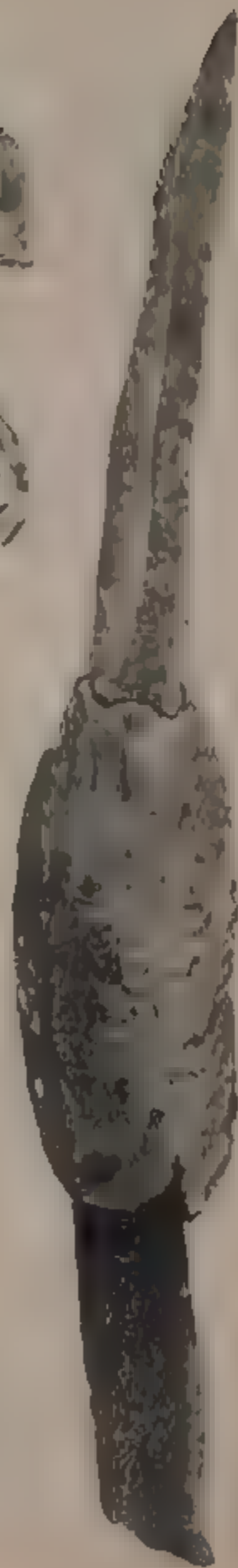
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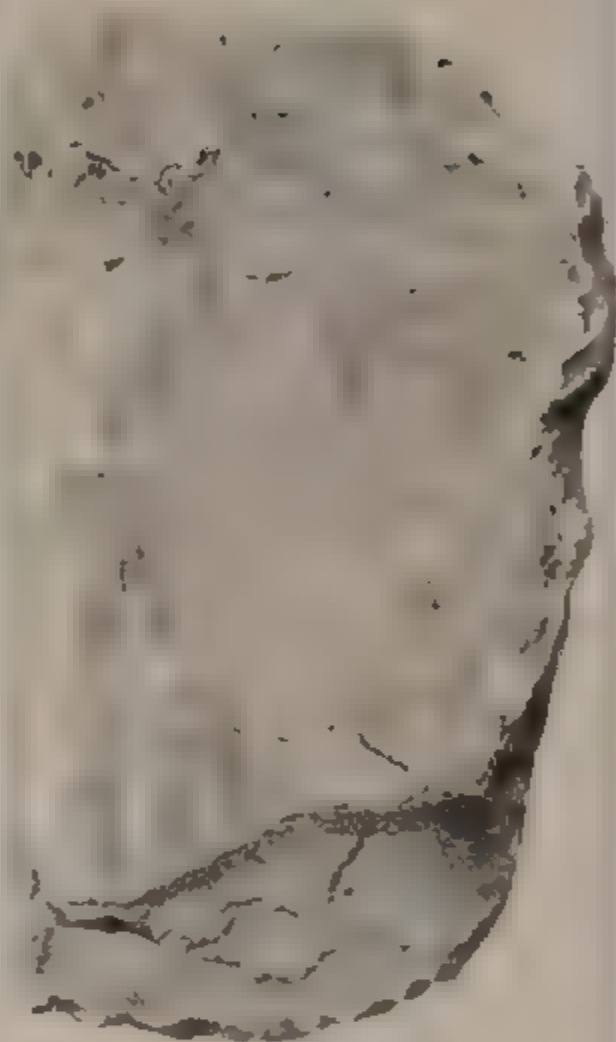
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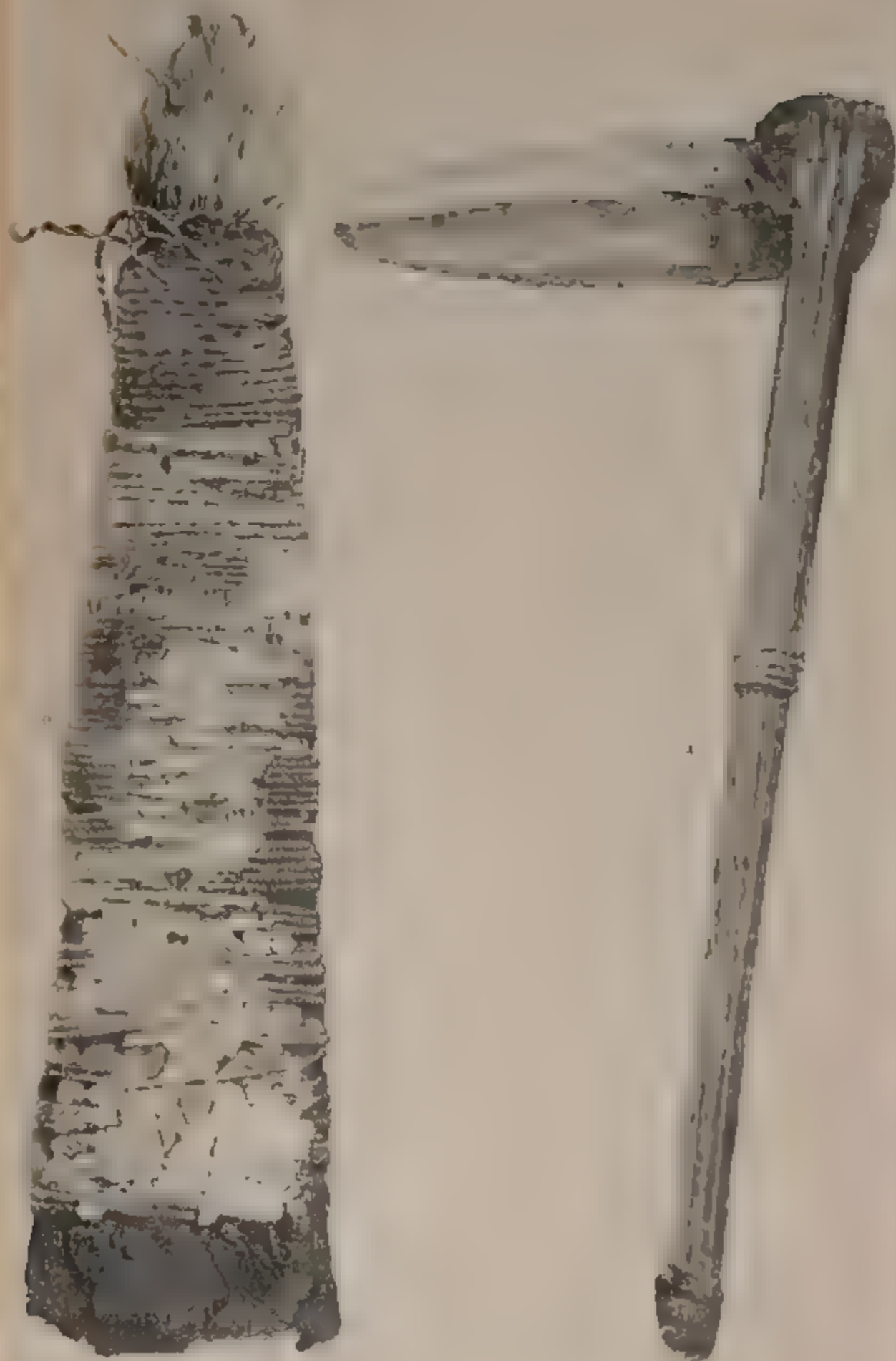


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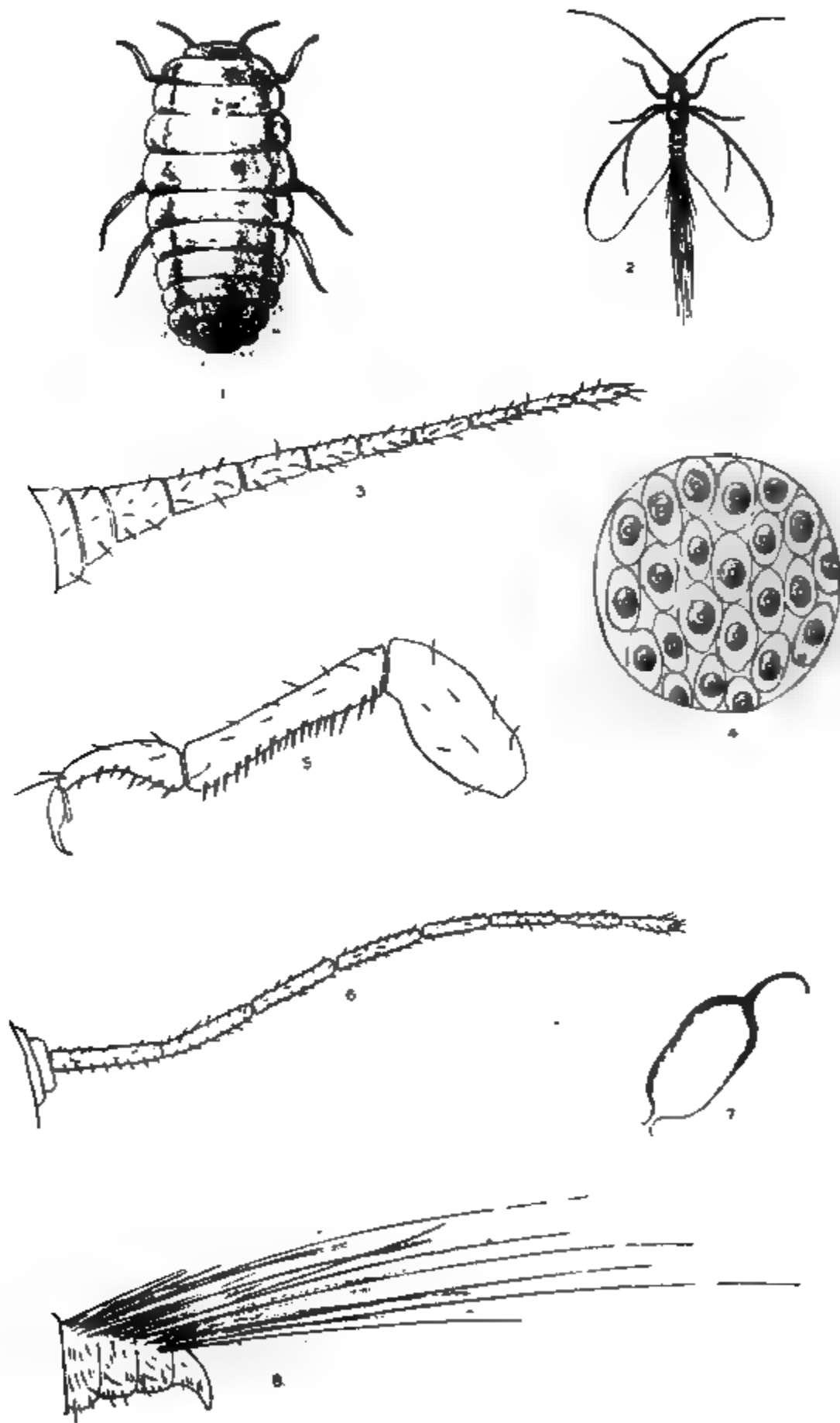


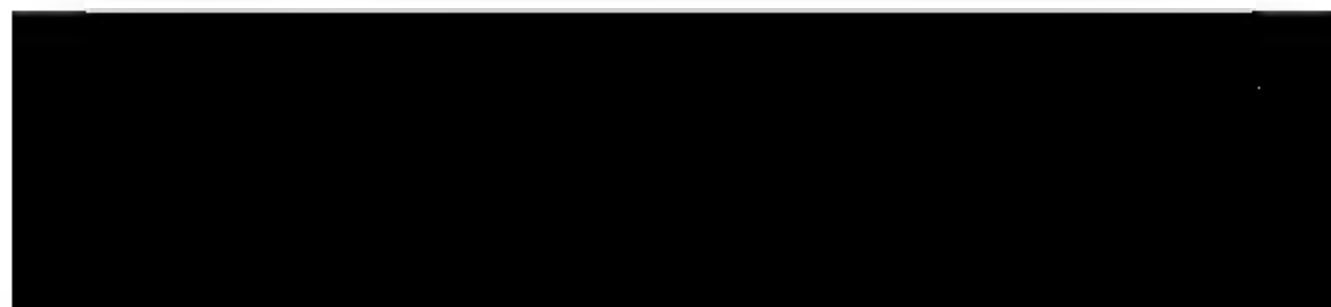
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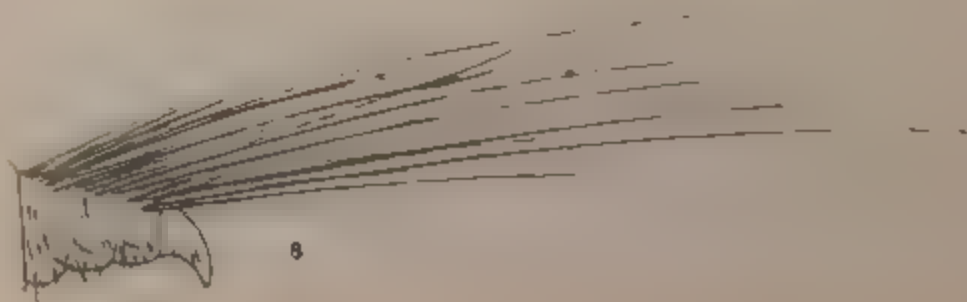
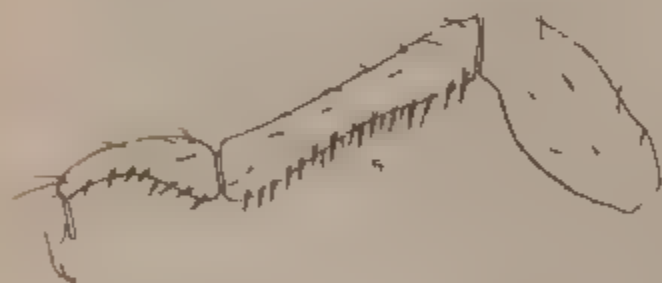
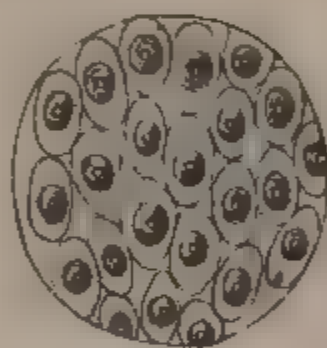
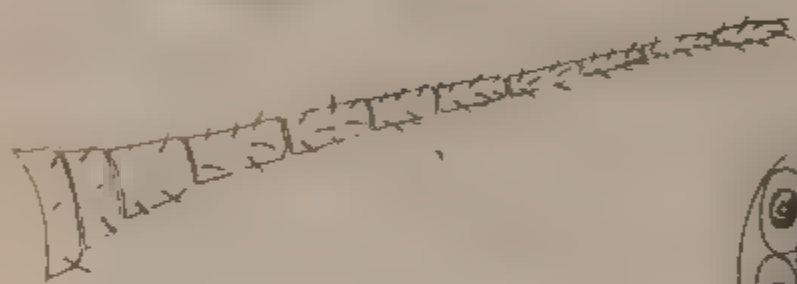
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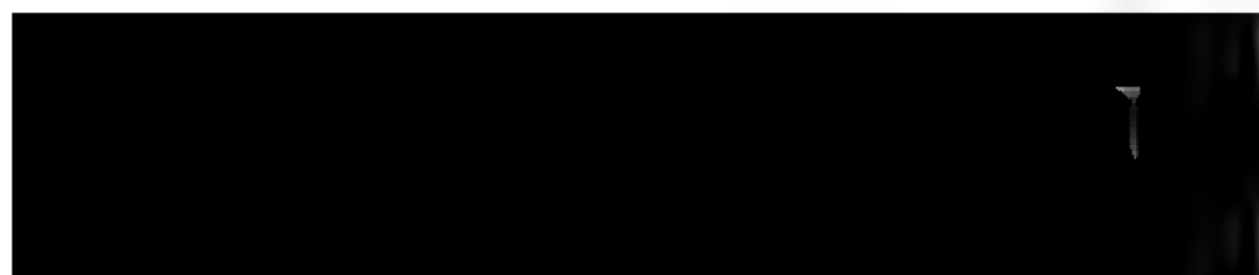










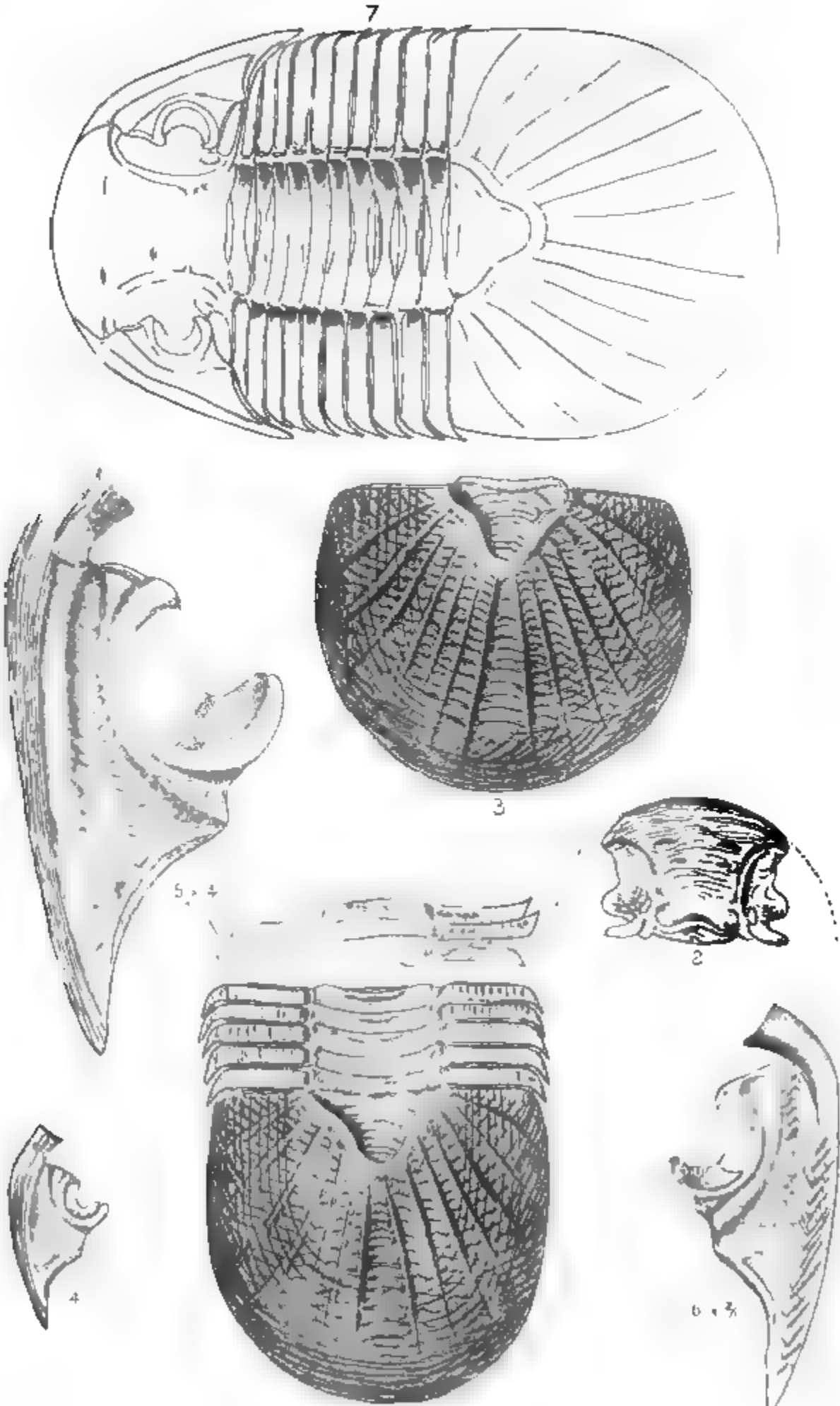








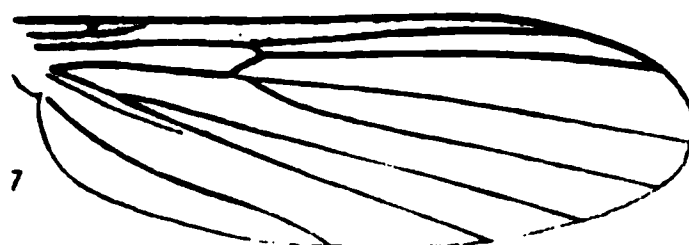
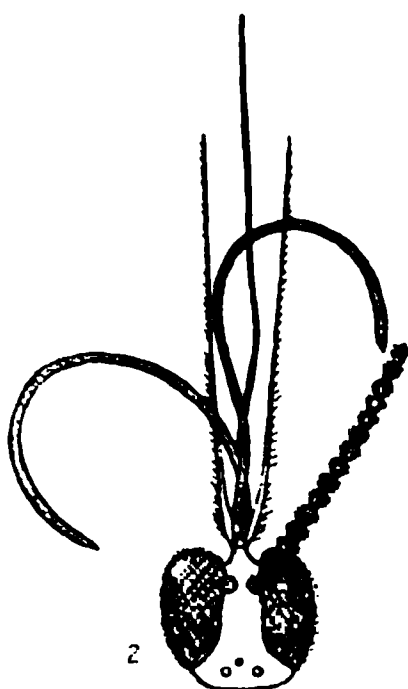
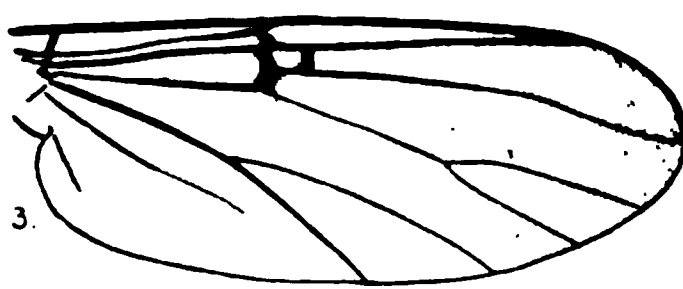


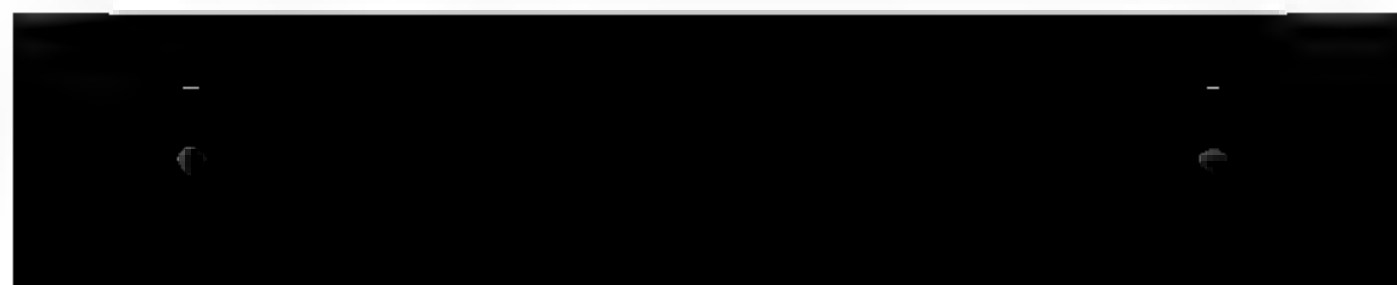


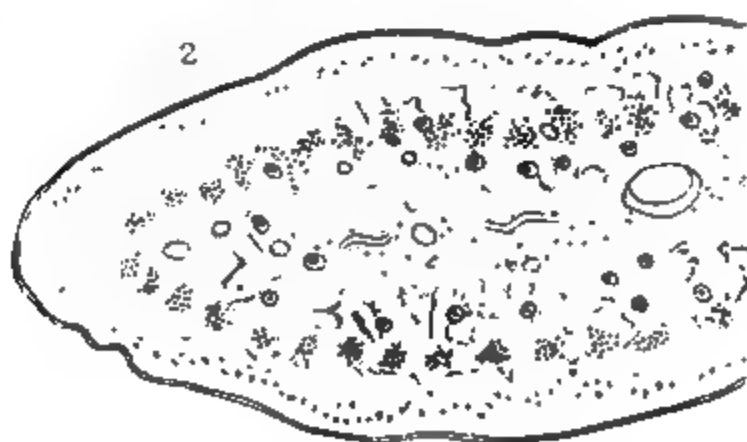
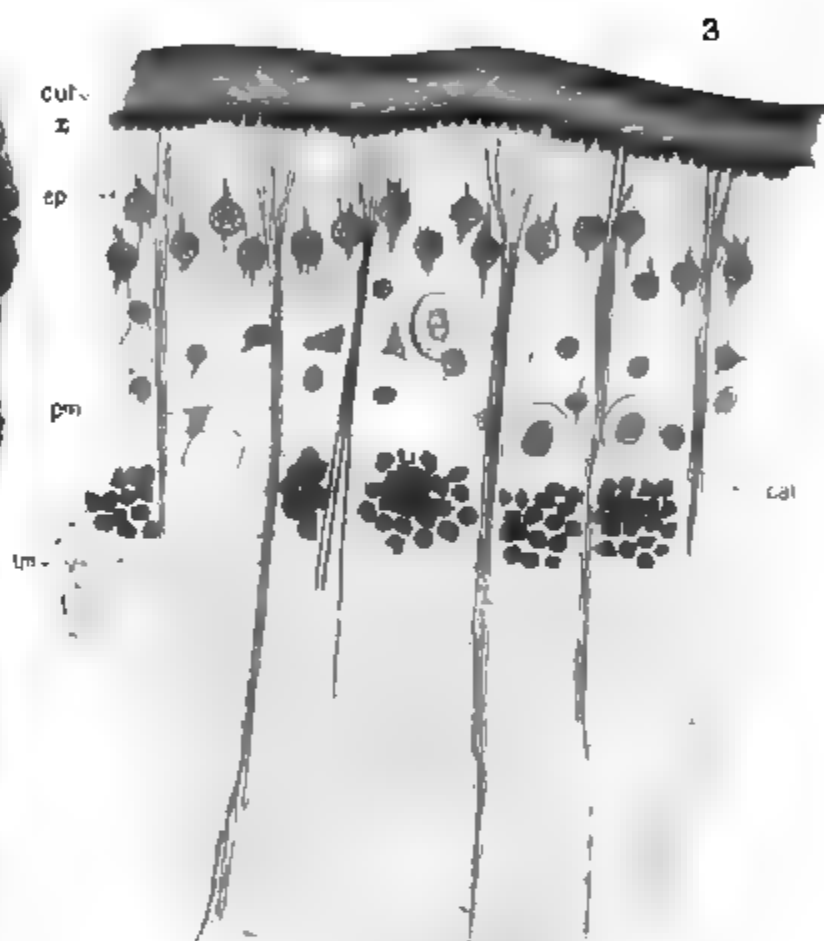
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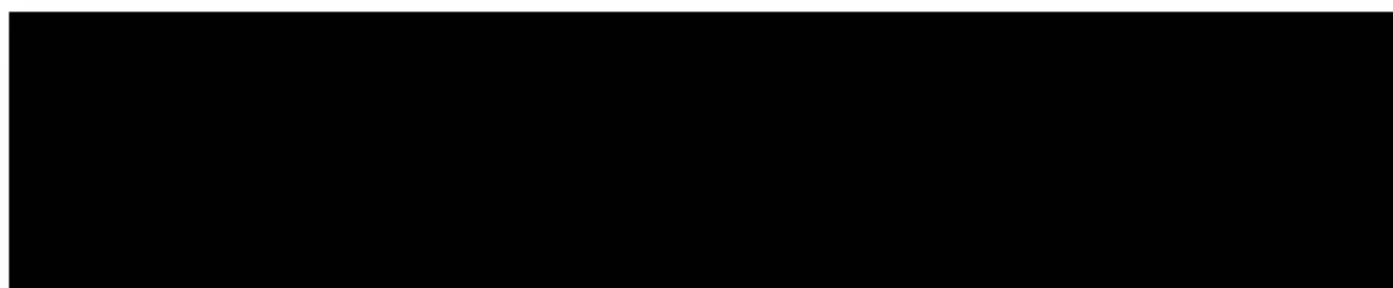














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